Chemical Week

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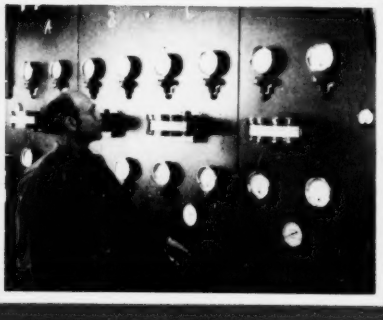

ODM's Fleming sees technical manpower short through '55; it's worse now than in wartime .. p. 11

CW Report: New Chemicals for Industry ..... p. 19

Carbide's Feild: Now dynel, other acrylic fibers can be easily dyed; copper is the key ..... p. 43

Lacquer and enamel touch-up cuts appliance rejects; aerosol packers cash in on new market p. 48

You'll have to pay more for phenol, wait longer for ample supplies p. 58

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Chemical Week

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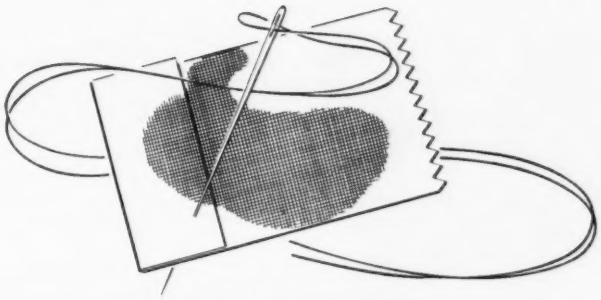

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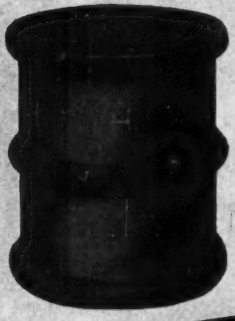

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OPINION . . . . .

Fast Write Off

To THE EDITOR: . . . I must take issue on a conclusion you make in your intriguing review of chemical labor unions *(CW, Nov. 17)*. You call labor's labeling of quick amortization as a tax kickback "demagoguery . . . without a basis in fact." Actually, the conclusion that through rapid tax amortization the private taxpayer foots the bill is closer to the truth than your statement.

If a company is allowed to reduce its own taxes by charging a greater rate of depreciation than normal, this overall deficit in taxes must be met by the individual taxpayer. . . .

T. B. WHITE
Oshkosh, Wis.

Our thanks for your viewpoint, Reader White, but we must disagree with your conclusion, speaking, as we were, from the long-range viewpoint. Unless taxes are sharply reduced sometime in the future, rapid tax amortization saves manufacturers nothing. As we wrote on Sept. 22: "Although a quick write-off was tempting, . . . it was only so if tax rates did not exceed their present levels for some time to come (not a good bet). But what . . . if tax rates go higher after the next five years, the period of write-off? Wouldn't it be better to spread out the write-off over a longer period of time, say twenty years?"—ED.

Footnote to P

To THE EDITOR: As a loyal reader, I have been fascinated by those footnotes which supply interesting—if incidental—facts. Unfortunately, in your story, "Now It's A to P," *(CW, Nov. 17)* you missed a bet for a footnote. The substance now known as Vitamin P got its name because an early source was paprika.*

R. K. LLEWELLYN
Birmingham, Ala.

Northern Sulfur

To THE EDITOR: Your excellent magazine has reeled off a quick sentence in its November 3, 1951 issue (Market Letter, p. 50) which might be slightly misleading.

The sentence: "Canada expects to turn out another 100,000 tons of sulphur from pyrites, refinery gases and smelting operations."

Firstly, Canada does not, of course, intend to manufacture sulphur from pyrite or smelting operations. Products such as sulphur dioxide and sulphuric acid will be made from these materials instead of from elemental sulphur.

The 100,000 ton figure which you use is approximately an annual rate of sulphur equivalent of these products. For the year 1952, however, the total of the sulphur equivalent of products made from pyrites and smelting operations and of sulphur itself recovered from natural gases, will be about 55,000 tons.

We eventually hope to considerably exceed the 100,000 ton figure.

G. K. WRIGHT
Chief Chemicals & Explosives Division
Canadian Department of Defense Production

We meant "sulphur equivalent," as Reader Wright suggests, inasmuch as elemental sulphur is largely oxidized to acid in any case. Our 100,000 ton figure refers to Canadian capacity by the end of 1952—not total 1952 output.—ED.

Westward Hassle

To THE EDITOR: Your use of the word "hassle" has received support from the "fourth estate". Attached is a report from today's (Nov. 9) *New York Herald Tribune* indicating that your understanding of its definition as a "violent argument" is correct. It is also evident that a New York localism seems to have spread itself as far West as Colorado Springs.

I thought Mr. Robert T. Stewart from Wisconsin, whose letter to you appeared in the November 3rd issue of CHEMICAL WEEK, might be interested in this Western hassle.

JAMES P. O'DONNELL
New York, N. Y.

Up-to-date CW keeps abreast of Hollywood lingo—or vice versa. The paragraph to which Reader O'Donnell refers, datelined Colorado Springs, quotes screen star Robert Mitchum on his scuffle in a local bar: "I wasn't angry. It was just a saloon hassle," Mr. Mitchum said in a telephone interview. "I may have roughed the guy up a little, but that's all."—ED.

All Wet

To THE EDITOR: Immediately after picking up the November 10th copy, we had a bad accident in which it was thoroughly soaked in water. Since I highly prize these magazines, I am wondering now if you can send a copy to replace this badly soaked and ruined copy.

Incidentally, there wasn't some kind of a directory or catalog accompanying Chemical Week originally? . . .

* We'll add that interesting—if incidental—fact to our footnote file.—Ed.

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OPINION . . . . . .

if there is . . . and it is of the same caliber as the weekly, I certainly would like to have my copy of it.

A. G. PETERSON
Manager
L. H. Butcher Co.
Salt Lake City, Utah

Two copies of CW are on the way to Salt Lake City: (1) a dry November 10 issue, and (2) Buyers' Guide Issue (mailed as Part Two of the November 17th issue).

CW thanks Reader Peterson for his kind remarks.—ED.

Kudos

TO THE EDITOR: . . . after nearly a year of reading your magazine weekly instead of monthly. . . . I follow the news of the industry more easily and thoroughly . . .

Congratulations on a fine job.

P. L. FROST
S. B. Penick & Co.
New York, N. Y.

The Sink and More

TO THE EDITOR: Just as I was ready to fill out the memo in your Oct. 20th issue . . . a couple of my collaborators came into my office. . . . They had had a good laugh at your article on "The Sink and More."

Frankly, we all thought that such a write-up had no place in a responsible magazine. No publicity should be given to therapeutic claims until sufficient proof is available for their correctness; as far as cleaning sinks is concerned, well . . .

NAME WITHHELD

CW appreciates your comments and doesn't know whether you and "your collaborators," read the Agava piece carefully . . . but our phrasings were precise and carefully chosen. We ran it for two reasons: It has a pretty high human interest value, and we thought people might be interested in it as a possible raw material for drain cleaners, etc. As a matter of fact, we've already had a couple of letters from people asking where they might locate supplies. News is news. CW prints it as it falls; publication is not synonymous with endorsement, should never be construed as such.—ED.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: The Editor, Chemical Week, 330 W. 42nd St., New York 18, N. Y.

Will Defense Production Be Caught in the Squeeze?

When Congress revised and extended the Defense Production Act, it relaxed a squeeze on business profits.

President Truman asserted that this action by Congress cripples the government in its effort to prevent inflation which, as he puts it, could lead to "enrichment and profiteering for the few, economic hardship and misery for the many."

He asked Congress to rescind its action.

This editorial—the second on problems presented by "escalator"clauses—aims to throw some light on this conflict of opinion.

The Squeeze

The squeeze on profits was imposed in the name of price stabilization. The idea behind it was simple. The *selling prices* of industrial products were to be held under a tight lid. But many industrial costs are affected by "escalator" clauses of one kind or another which tend to boost production *costs*. Thus, with rising costs and fixed prices, profits would be squeezed and much of the cost of defense would thereby be shifted from those favored by escalator clauses to business concerns.

The mechanics of this squeeze on profits were complicated. But here, in brief, is how it was to work. The first step was to require manufacturers to set ceiling prices, effective May 28, for their products.

These ceiling or maximum prices were to allow for increases in manufacturers' costs that had occurred since Korea. *But they did not allow for all increases.* Manufacturers, for example, could not include increases in indirect costs—office or selling costs. Neither could they, in calculating their new prices, include increases in the costs of materials or direct labor that had come after March 15. This was the first phase of the squeeze on profits.

The second phase was prepared by **not** putting a ceiling on costs. The Wage Stabilization Board said it could not disturb the operation of "escalator" clauses by which wage rates are geared to the cost of living. Moreover, nothing could be done to curb the operation of the farmers' "escalator" clause, the farm parity arrangement. Under it, the federal government underwrites higher prices for farm products to match increases in the cost of things farmers buy. So this left wages and many materials costs free to rise against a ceiling imposed on the prices of what industry has to sell.

Relief—at a Loss

On two conditions only would the Office of Price Stabilization permit a company to raise its prices and escape this squeeze. One of these was that increased costs had more than wiped out its profits; in other words, that it was operating at a loss. The other condition was

that the industry of which the company is a part was not, as a whole, making "excess profits." That is, the industry, as a whole, could not get price relief if its overall profits before taxes were greater than 85 percent of its average profits during the best three of the four years from 1946 through 1949. Many companies expected that their profits would be cut drastically before they could get through this narrow escape hatch.

When this squeeze on profits was set up, we were told that industry as a whole was reporting record profits. But, it was equally true that wage rates and farm prices also were at record high levels. And it was also true that, under the impact of rising taxes and the dislocations caused by the defense mobilization program, profits actually were on the way down.

Profits — Going Down

By the time Congress acted to relax the squeeze, corporate profits, after taxes, were running at a rate 20 percent lower than they had been six months before. And the clear prospect was that they would continue to decline.

So the issue put up to Congress was simply this. Should business firms stand so much of the brunt of the defense costs while "escalator" clauses continued to exempt organized workers and farmers from paying their share of those costs?

But this question actually is much broader than one of fairness or unfairness alone. One certain effect of such a squeeze on profits would be to undercut the capacity of private industry to install the new plants and equipment needed for our mobilization effort. Today — unlike World War II — private industry is financing almost all of our huge program to expand production. And about two-thirds of the money that has been plowed into the expansion and improvement of our industrial machine since World War II has come out of profits.

In view of all this, Congress decided last summer to relax the pressure on profits. This was done by the controversial Capehart Amendment to the Defense Production Act. This amendment has serious administrative weaknesses. But some measure with the same purpose is needed to maintain profits at a high enough level to finance the huge and continuing expansion of our industrial machine that is now underway.

Basic Issues

As soon as the amendment was enacted, the President asked Congress to revise the law again. The heart of his proposal was to restore to the Administration the powers it used last spring to arrange the squeeze on profits outlined here.

This controversy will continue. There can be no final answer to it as long as we have the economic controls made necessary by mobilization.

But if we look beneath the surface of this technically complicated controversy, we shall see clearly that the basic issues are:

1. Whether we really shall make an effort to distribute fairly the burdens of inflation caused by our defense mobilization —

2. Whether farmers and organized workers should be exempted from these sacrifices by escalator clauses — at the expense of the nation as a whole —

3. Whether profits should be squeezed still more — at the risk of putting a fatal squeeze on the effort of industry to build new plants and install new tools. These new facilities are essential to maintaining American living standards — and they are the heart of our ability to defend ourselves and the rest of the free world.

Americans face no more important economic issues at this time.

McGraw-Hill Publishing Company, Inc.

NEWSLETTER

If you don't believe technical manpower is hard to get (see p. 11) take a look at what Du Pont's doing:

The company is running 6" x 10" display ads as far afield as Syracuse, N. Y., seeking engineers for its atomic energy project at Augusta, Ga., its Wilmington operations and other sites.

Interesting angle: One would expect to find the ad in the help-wanted section, but it's not—it's in the sports pages.

But while production and expansion and engineering proceed at a dizzy pace, the mills of the law courts grind slowly:

Although the Du Pont-I.C.I.-Remington "cartel" case was decided weeks ago (CW, Oct. 13), several steps remain to be taken before Federal Judge Ryan hands down his final decree.

He first met with the defendants and Justice Department officials to set up a tentative program. Step one: The defendants will shortly file a counterproposal. Step two: Briefs on these counterproposals will be filed, and arguments heard on the legal issues.

Finally, testimony will be taken; Ryan can then issue a final decree.

More testimony will be taken in still another Governmental sphere. The Bureau of Mines hasn't given up on coal hydrogenation in spite of the National Petroleum Council's adverse report (CW, Nov. 17).

An independent consulting firm, Ebasco Services, Inc. (New York), has been retained for an engineering audit and a re-evaluation of the B of M report, "Cost Estimate for Coal Hydrogenation."

Ebasco plans to get ammonia expert Charles O. Brown to evaluate the high-pressure phases of the proposed process.

The project—actually under way before the Petroleum Council's report was made public—will take about three months to complete.

Two other newsmaking processes involve titanium and uranium.

A graduate student at Columbia University has come up with an electrolytic process for titanium involving reduction of the chloride, which is made, in turn, from the native oxide.

Comparing it with existing processes, Columbia says, "There is reason to believe that Mr. Kerbecek's . . . may be less expensive."

A bonus: The method also works for zirconium. Next step: a pilot plant to determine product acceptability and process economy.

Uranium from phosphate rock is winning the attention of several chemical and fertilizer companies.

The Atomic Energy Commission anticipates that recovery facilities will be incorporated in International Minerals & Chemical Corp.'s and Virginia-Carolina Chemical Corp.'s new wet-process acid plants.

The first plant to recover uranium from phosphoric acid is now under construction at Joliet, Ill., by Blockson Chemical Co.

U. S. Phosphoric Products Div., Tennessee Corp., is piloting a process; and Mathieson Chemical Corp. is winding up research, expects to start pilot operations soon.

General Chemical Division, Allied Chemical & Dye, is pilot-planting uranium recovery from sodium phosphate manufacture.

You can expect to hear more about another new process—so far embodied only in a patent (U.S. 2,570,543) but which may revolutionize power generation: It's the long-postulated-but-never-achieved carbon cell.

Carbon reacts with steam to give water gas, which is oxidized electrochemically; hydrocarbons such as methane can also be used.

While the thermal efficiency of ordinary fuel-burning processes rarely exceeds 30%, the electrochemical method can be 75% efficient.

Alberta isn't the only Canadian province to enjoy an oil boom.

Pacific Petroleum Ltd. struck oil at Fort St. John, B.C., and within four days 52 applicants sought oil rights to 4 million acres.

But it still remains to be proved that the deposits are large enough to warrant a boom; they're over 700 miles north of Vancouver.

Meanwhile, Alberta's hopes for commercialization of its far-north tar sands, in Athabasca, possibly with the help of Anglo-Iranian Oil Co., suffered a jolt when the Britishers declined. Reason given: It's still uneconomical to separate the oil.

In Washington, it looks as if a cutback on Government civilian employees has scotched a manpower scare.

Officials have cried that they couldn't get enough technical people to man their programs, but very few have been appointed from the thousands of top college graduates passing the Junior Administrative Officer test a couple of years ago. Civil service administrators admit they have no place to put them.

Engineering personnel is short, however—particularly in the upper brackets—and it's in this area that the Government is actively competing with industry.

A new angle has been introduced into the Government's controversial security order. Senator John Sparkman (D., Ala.), chairman of the Senate Small Business Committee, says "small businessmen are fearful of the DPA-NPA security regulations."

He has asked DPA Administrator Fleischmann for assurance that the prime objective of DPA's committee will be to disseminate the largest possible amount of technical information.

Look for two new P & G washing machine compounds to complement "Tide." Procter & Gamble has recently conducted a house-to-house survey in Toledo, passed out samples to housewives to learn their preference.

Significant angle: Distribution **was** limited to those who didn't use any water softener.

It looks like more Texas operations for Du Pont. The company has acquired an option on 500 acres of land on the ship channel between Beaumont and Port Neches for a multimillion dollar chemical plant.

The Delaney Committee visited the state of Washington last week, learned about a U.S. Public Health Service project there to determine the effect of DDT on human fat and of organic phosphorus compounds on blood enzymes.

USPHS is getting voluntary monthly blood samples from residents of orchard and non-orchard areas. Fat samples come from surgery cases.

. . . The Editors

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	Butanol	Butyl Acetate
Molecular Weight (calc.):	74.12	116.16
Specific Gravity at 20/20°C:	0.810—0.813	0.872—0.880
Pounds per U.S. Gallon at 68°F:	6.756	7.30
Coefficient of Cubical Expansion, per 1°F:	0.00052	0.00067
per 1°C:	0.00093	0.00121
Boiling Point at 760 mm, °C:	117.7	126.5
Vapor Pressure at 20°C, mm:	4.3	10.1
Product-Water azeotrope, Boiling Point, 760 mm, °C:	92.7	90.5
Proportion of Product, % by weight:	57.6	72
Melting Point, °C:	-89 (approx.)	-76.8
Refractive Index, n_D at 20°C:	1.3993	1.3947
Flash Point, Tag Open Cup:	116°F	102°F
Solubility in Water at 25°C, % by vol.:	8.9	0.5
Solubility in Water in Product at 25°C, % by vol.:	17.12	1.6

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November 24, 1951 • Volume 69 • Number 21

Chemical Week

BUSINESS & INDUSTRY . . . . .

Manpower: Shorter Still

Office of Defense Mobilization's latest survey underlines the dearth of technical manpower. The shortage is as great now as it was during World War II.

Present deficit of chemists and engineers will last at least through 1955; no remedy is in sight.

Washington manpower experts this week were again shaking their heads and mumbling into their beards. A new manpower survey predicts a continuing scarcity of technically trained personnel—with little hope of satisfying the demand.

These facts are contained in an evaluation of the supply and demand for specialized personnel which was made by the top-level Office of Defense Mobilization manpower group headed by Arthur S. Fleming. Much of the source material was collected by a task force under the general chairmanship of John Hilliard of the Department of Labor's Defense Manpower Administration.

The evaluation, pointing out shortages, is to serve as a guide in the training and utilization of specialized personnel, based on the mobilization goal of a 3.5 million-military establishment and expansion of productive capacity to supply this force and still maintain a "vigorous" civilian economy.

The report could easily be the forerunner of more liberal draft deferments for technical college trainees, since it points out that the number of qualified college graduates is decreasing, and will continue to decline for several years.

Specific forecasts were included along with the much broader policy statements. Many of the facts and figures weren't new, but they were first brought together officially.

• **Engineers.** Shortage here developed in mid-1950 and is expected to continue until 1955 or so. Requirements estimated at a minimum of 30,000 per year—but probably much higher in the next year or two. Graduates from engineering schools will be 26,000 in 1952; 20,000 in 1953 and 17,000 in 1954. Unless overall policy is changed, some of these will be drafted into the armed services.

Chemical engineer shortage will not be as acute as some others. Aeronautical, electrical (including electronic) and mechanical engineers will be harder to find than chemical. Civil engineers are scarce, but if material shortages hamper the rate of building, more may become available.

• **Chemists.** Supply is short, but not as acute as in some engineering fields. Demand is rising, particularly for those with doctorates. A decline in college graduates—especially four-year students—is expected, chiefly because of fewer G.I. enrollments. Classes of 1952, 1953 and 1954 will be, respectively, only 48%, 45% and 39% the size of the record year 1950, when 10,619 chemistry degrees were awarded.

Capsuled Time: The shortage of chemists and engineers is one of the most significant effects of the defense program, which has accelerated both military and industrial technological work. As a result, industrial and scientific development which normally would have been spread over a decade now must be telescoped into less than half that time. This brings an unprecedented demand for technical manpower.

The advance of scientific knowledge also requires more specialized personnel in industrial operations. The worker—engineer ratio in a plant, for example, has decreased from about 250 to 1 in 1900 to about 75 to 1 at present.

Record college enrollments under the G.I. bill provided a large supply of technical manpower. Despite the wartime dearth of technically trained graduates, the outlook for employment wasn't too bright in parts of 1948 and 1949. At present, however, increased demands have absorbed everyone available.

Problem Ignored: The manpower experts skirted the basic problem, probably because there was so little they could do about it. Private employers are reluctant and Government agencies are unable to pay—consistently, year after year—wages high enough to encourage a supply of technical manpower adequate for boom-period demands.

Current List of DPA-Certified Chemical Facilities

COMPANY	LOCATION OF FACILITY	PRODUCT	AMOUNT ELIGIBLE	PER CENT
Allied Chemical & Dye Corp.	East St. Louis, Ill.	Sulphuric acid	$1,627,000	70
Great Southern Chemical Co.	Corpus Christi, Tex.	Chemical grade benzene and toluene	1,200,000	90
			2,150,000	65
			600,000	45
			50,000	15
Deep Rock Oil Corp.	Cushing, Okla.	Benzene, toluene, xylene	1,550,000	90
			1,525,000	65
			175,000	40
Hugoton Plains Gas & Oil Co.	Tyrone, Okla.	Iso-butane	119,250	
Panoma Corp.	Texas County, Okla.	Iso-butane	211,400	90
Tide Water Associated Oil Co.	Avon-Contra Costa County, Calif.	Hydrogen sulphide	400,000	70
Standard Oil Co. of Calif.	Richmond, Calif.	Benzene	1,079,400	90
			107,600	45
Pittsburgh Coke & Chemical Co.	Pittsburgh, Pa.	Power plant	1,836,000	60

Striped Trousers

A program designed to keep us on top of foreign scientific developments is now being set up in the State Department. An Office of Science Advisor has been set up and a staff is being recruited for duty at key overseas posts.

An important function of the new organization will be the reporting of research and technological information gained by personal contact. In some scientific areas, there is now a three- to five-year lag in the flow of information on foreign technical developments. It is felt that this time-loss could be reduced materially by on-the-spot coverage with an eye toward eliminating the long wait for publication in the conventional literature.

Key post in the newly created diplomatic arm is that of Science Advisor.

JOSEPH B. KOEPFLI: Ivory tower types are dispensable.

Filling that position is Joseph B. Koepfli, professor of chemistry on leave from California Institute of Technology. Koepfli is currently trying to work up a staff for foreign service. Scientists sent abroad rank as diplomatic attaches, are appointed as officers in the Foreign Service Reserve for periods ranging from 15 months to three years.

Although only a few people are needed to staff overseas posts, Koepfli is having a hard time filling his roster. The man sent abroad must be of top-level caliber and be fluent in the language of the country to which he is assigned. Moreover, he can't be an "ivory tower" type; an important part of the job is getting out and spreading good-will. Obviously men with these attributes are not too easy to come by—especially those who are willing to give up their work for a minimum of 15 months.

There is little doubt that the State Department project will take time to get into smooth working order. But eventually users of scientific information—both in government and industry—have a right to expect results. If the ability of the new research diplomats is any gage, these results will not be long coming.

Switch to Shale

Secretary of the Interior Oscar Chapman, who has long been plugging coal hydrogenation as the best way to extend supplies of chemicals and liquid fuels (CW, Oct. 20), has switched tunes: Liquid fuel from oil shale is now number one in his hit parade.

This change of heart came soon after the National Petroleum Council released its $300,000 report on synthetic fuels *(CW, Nov. 17)*. The report's estimates were devastatingly unfavorable to coal hydrogenation, citing production costs of 43.5¢/gal., compared to 14.7¢/gal. for fuel from oil shale, which is not too far above petroleum, currently at 12-13¢/gal.

The shift in Interior's party line came in a speech Chapman was to give before the American Petroleum Institute.*

Said the Secretary: "Personally, I feel that the time has come to give the development of oil from shale a serious try, and I think that private industry should be encouraged to tackle the problem on a commerical scale. . . . .

"In the field of coal hydrogenation, the situation is somewhat different. . . . It is accepted that, barrel for barrel, it would be cheaper to produce ordinary liquid fuels from oil shale than it would by the coal hydrogenation process."

The Other Side: API President Frank Porter painted a different picture: "It is true that America is blessed with large reserves of oil shales, tar sands and coal deposits which are capable of producing the petroleum requirements of this country for many years to come. But at this time, with the great amount of unexplored future petroleum prospects which we have for the production of natural crude oil and gas, the building of commercial synthetic plants is unwarranted."

Construction of either shale or coal facilities, Porter asserted, is an unnecessary and uneconomic use of capital, labor and materials at the present time.

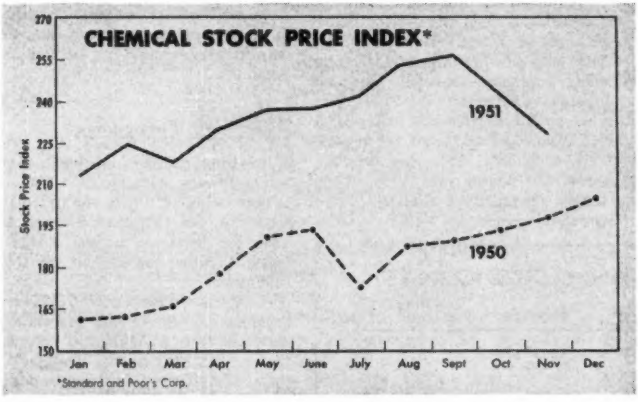
But despite industry opposition, typified by this comment, Chapman is apparently going ahead with his oil shale plans at the speed with which he was pushing coal hydrogenation.

It was this headlong rush for approval of coal hydrogenation facilities which catalysed James Boyd's resignation as director of the Bureau of Mines *(CW, Oct. 13)*. Boyd had favored hydrogenation, but wanted to hold up approval for a few weeks until cost figures would be available from NPC's report. Chapman, however, couldn't wait.

Silence is Golden: The new director of the Bureau of Mines, named last week, is John J. Forbes, who isn't expected to oppose (in public, at least) any of Chapman's policies. Where Boyd's independence of action kept him continually in hot water with such curmudgeons as John L. Lewis, Forbes is considered to be a man who is politically innocuous.

And one way to stay out of political hot water is to say nothing about such controversial subjects as synthetic liquid fuels.

* A bad cold and laryngitis sidelined Chapman. The speech was read for him by Bruce Brown, deputy administrator of the Petroleum Administration for Defense.



Assay of Chemical Stocks

WALL STREET EXPERTS expect an early halt in the decline of chemical stock prices. One brake will be the hope of bigger dividends in the fourth quarter as the tax bit eases. For the profit tax due under the new tax bill (retroactive to April 1) in some cases has been carried entirely by third quarter earnings. Another sustaining factor is mounting defense orders, conducive of an optimistic chemicals business outlook. Thus, at current price levels, chemicals stocks qualify as better-than-average investments in the largest growth sector of the industrial economy.

With vocal opposition within his department apparently stilled, Chapman is continuing to plug for synthetic fuels. But despite his new emphasis on oil shale, he may switch back to coal hydrogenation later. This policy is clearly obvious from the conclusion of his address to the API:

"I deem it my plain duty as Secretary of the Interior to advance the development of liquid fuels from shale and by synthesis from coal, by any and all feasible, seasonable, sensible means consistent with national laws, national interests, and national policy. . . . I think that on reflection you will agree it is a job someone must do and that it is, in fact, a part of my job as Secretary of the Interior."

The unfortunate thing is that Chapman's definitions of terms differ widely from industry's interpretations.

Black Problem

Nearly all natural gas hydrocarbons can be converted into carbon black, and they are the traditional source for this most important rubber reinforcing pigment. But the price of gas is on the ascent. More important, perhaps: synthetic rubber requires high-structure* furnace blacks (manufactured most economically from highly aromatic liquid hydrocarbons) if the best results are to be attained.

For an appraisal of these changes CW editors turned to C. A. "Andy" Stokes, director of research and development for long-time carbon black manufacturer, Godfrey L. Cabot, Inc.

According to Stokes, the provision of adequate liquid raw material supplies at a low price is one of the most pressing problems facing the carbon black industry.

The magnitude of this problem is best indicated by the change in a statistic: In 1950 only slightly more than a quarter of the carbon black manufactured came from liquid hydrocarbons. But the end of 1952 should see at least half of the world's black provided by this source.

Reason: The trend is toward the use of finer, high-structure blacks, which are most economically produced via the furnace process, from highly aromatic liquid hydrocarbons.

Manufacture of furnace black differs from that of channel black (half of the total in 1950) principally in the type of flame employed. In the furnace process partial combustion of the hydrocarbon takes place under closely controlled high-turbulence, long-flame conditions. Channel black on the other hand, is formed by impingement of a short, quiescent diffusion flame on a cooled metal surface; its unavoidable exposure to air after deposition causes appreciable surface oxidation of the black.)

Looks Like Plenty . . . .: Unfortunately there is a limited quantity of this type of liquid fuel. There are more than enough aromatic hydrocarbons in petroleum refinery fractions to meet all foreseeable demands, but they are not in fractions with the requisite high percentage of aromatic hydrocarbons. Sufficient fuel will be required to form about one billion pounds of black per year—it amounts to 10-13 million barrels, at an average yield of 30-35% on a weight basis.

Suitable refinery streams for black manufacture are cycle gas oils and tars from catalytic and thermal cracking. In absolute quantities, the potential carbon black fuel in the U.S. will by 1953 amount to approximately 150 million barrels per year—ten to twelve times as much aromatic petroleum fuel as would be required for the entire world carbon black industry.

. . . But Maybe There Isn't: Much of this aromatic fuel is separated at a dilution below the economic minimum for black manufacture. These oils are used directly in light heating fuel streams or to cut back the high viscosity of bunker fuel oils.

Perhaps only 20% to 30% of the cycle oils can be used directly. Taking this factor into account, the estimate of the *available* supply of carbon black fuels becomes only two to four times the demand. Taking location factors into account cuts this estimate again—perhaps by half.

The above estimates are based on the assumption of normal peacetime petroleum requirements. War has increased the amount of oil cracked, making more raw material available; but on the other hand, Navy special fuel is calling for more aromatic tars.

Demand is up for high-octane gasoline. This would tend to reduce the amount of aromatic cycle stock; but it should, in turn, raise the average aromatic content of the stock. The net result of these opposing forces is difficult to determine.

The over-all picture that has been presented will probably not be too greatly changed by these several factors. The threat of an imminent dearth of raw material will continue to hang over the industry.

A portion of this requirement could well come from coal tar. But the supply of coal tar is limited and usually has a higher value than carbon black manufacturers can afford to pay.

STOKES: A threatening dearth, a strong competitor.

Little is known of the suitability of tar—such as that to be produced by the Alcoa project in Central Texas—by low-temperature carbonization of coal. But these tars are quite aromatic, and undoubtedly ways and means for their utilization will be found.

Inorganic Threat? But the raw material problem is not the only one the carbon black industry faces: When the price of a qualitatively competitive inorganic reinforcing agent approaches that of carbon black—probably at a level of 10¢-12¢ a pound—carbon black is in for a stiff fight. Present price of highest grade reinforcing black: 7.9¢ a pound.

Of the several pigments that have appeared, silica is the most likely threat because of its low specific gravity, its close approach to carbon black reinforcing properties, and the probability that it can be made cheaply on a large scale.

This then is probably the next chapter that will be written in the history of reinforcing pigments.

LABOR . . . . . .

An 8% wage increase has been granted to 400 employees of Aluminum Co. of Canada's Etobicoke works, in a new agreement with the United Steelworkers of America.

The increase brings the hiring rate to $1.21½ an hour, or $53.46 for the normal 44-hour week. The agreement also calls for a maximum rate of $1.79½ an hour, and an increase to eight paid statutory holidays.

* Structure is a hard-to-define property of carbon black perhaps best visualized as representing the relative strength of the bonds or agglomerative forces between the individual carbon black particles. A carbon black has high structure if the carbon black chains or agglomerates persist after continued application of mixing energy to a carbon black-vehicle system.

REMENSNYDER: Trades assets for raw material control.

Heyden Integrates

Latest expression of Heyden Chemical's new theme, vertical integration, is its purchase of 60 acres of land adjacent to the Houston Ship Channel. The site is to be used for a plant to manufacture methanol—precursor of formaldehyde—and other derivatives. The end of World War II saw late-president B. R. Armour lead Heyden, long-time manufacturer of formaldehyde, into a broad program of diversification.

Having entered the antibiotics field shortly before the end of the War, Heyden proceeded to acquire a long list of companies with activities ranging from retail drug sales to potash. Included in these acquisitions:

- C. E. Jamieson & Co.—manufacturer of drugs and pharmaceuticals.
- An interest in American Plastics Corp.—plastic molders and extruders.
- A near-$5 million investment in American Potash & Chemical Co.—maker of salt cake, soda ash, potash, etc., from Searles Lake, Calif., brine.
- A war-built caustic-chlorine plant at Memphis, Tenn.
- Rumford Chemical Works—producer of baking powder, sulfuric acid, other items.
- Nyal Co.—distributor of over-the-counter drug items.

Integration Enters: As can be seen by the above list of companies it's quite transparent that this potpourri was anything but an integrated investment pattern.

In recent years, however, under J. P. Remensnyder's presidency, Heyden has pursued a course which apparently is designed to bring its future activities to a head under three broad categories:

- Drugs and pharmaceuticals.
- Methanol, formaldehyde and pentaerythritol.
- Chlorinated toluene derivatives.

To this end the company has divested itself of its Rumford, American Potash, and caustic-chlorine holding.

Supporting the above conclusion is the way that proceeds from a recent issue of 53,300 shares of $4¾ cumulative second preferred stock are to be utilized:

- Antibiotics—$5.9 million at Princeton, N. J.
- Formaldehyde and penterythritol—$1.6 million at Garfield, N. J., and about $1 million for the company's share in the new plant to be erected for the joint account of Heyden and Shawinigan Chemicals, Ltd., at Montreal.
- Other chemicals—about $1 million.
- The $12 million methanol plant will probably be financed principally from a portion of the proceeds of the above stock sale plus the $5,389,000 received for Heyden's interest in American Potash from Mathieson.

Completion of these many changes will provide Heyden with a much more tightly integrated line of products plus a closer control on the raw materials for formaldehyde (18% of the net sales for the first six months of 1951) and penterythritol (21.4%) manufacture.

Preventing Prevention

A new accident prevention agency may be established if Congress acts favorably on a proposal to be considered next January. But whether or not it gets out of the talking stage may depend on the outcome of a bureaucratic battle.

The inter-agency fight can be expected since the bill would give the Labor Department the authority over accident prevention which the U.S. Public Health Service—in its opinion, at least—now exercises.

The battle-brewing bill is sponsored by Minnesota's Senator Hubert Humphrey, and apparently is a part of the administration's Fair Deal legislative program.

Moderation in extending Governmental authority has never been one of Senator Humphrey's traits—and his sponsorship of this bill is no exception. The proposed bureau would set up an accident prevention board for each industry, with each board given the power to make legally-enforcable rules and regulations on standards of safety.

The bill has manufacturers worried because it will extend a tentacle of the Government-control octopus into new fields. Where past legislation on general safety matters has called for cooperative responsibility by both Government and industry, this new proposal would give much more power to the Federal Government.

The need for over-all standards in any industry is something no manufacturer will debate, but his fear of overly stringent government policies has been heightened—not lowered—by past instances of bureaucratic control.

On-The-Job College

Recently beginning its sixth continuous year, the Humble Oil & Refining Co.'s Lectures on Science series constitutes what is probably the only "company university" in the country. Actually the lectures have brought to Humble's Baytown plant a faculty no normal university could possibly duplicate. In the five years of operation, two dozen top chemists, physicists, and chemical engineers of the country have come to Baytown to teach their specialties, giving Humble's technical people access to a pool of knowledge that would be virtually unobtainable at any single university.

Geographically alone the list of academic leaders teaching their particular field at Baytown is impressive. They have come from Harvard and Utah, from Minnesota and Texas, and one was invited all the way from Leeds University, England, because he was the best man in his field.

Knowledge Lag: For many years, Humble, like most other companies, was faced with the fact that its technical and research people had a tendency to get out of touch with advances in their fields. Day-to-day problems have a way of crowding out the larger considerations—the old story of losing sight of the forest by too much attention to the nearest trees.

The more usual way to combat this problem is to encourage employees to take part-time courses at a near-by university (if one is available), or to grant lengthy leaves-of-absence so that the men can take

refresher courses at some selected university. But both of these plans have their drawbacks: The nearest university is not always the best, and certainly never the best for all subjects. The leave-of-absence invariably involves travelling to distant schools with dislocation of normal home life.

Bring The School: Humble decided it would try a third way: Bring the university to the plant. In this way the prospective students can remain at home, stay in close touch with the plant, and have the advantage of picked lecturers—all top men in their fields. The men have more control over what they study, instead of being at the mercy of the academic curriculum of any particular school.

The lecturer, relieved of other duties and considerations, devotes his full time to the course in hand, and goes into greater detail with the picked class he faces. Since all students are trained technical and research personnel from Humble, problems are related more closely to the practical work they normally perform. Finally, the class can be rigidly limited to a small number of deeply interested and receptive students.

Voluntary and Intensive: Choice of lecture is completely voluntary, and each lecture course normally lasts two weeks. But during these two weeks the student, relieved of all plant duties, studies from 12 to 15 hours a day.

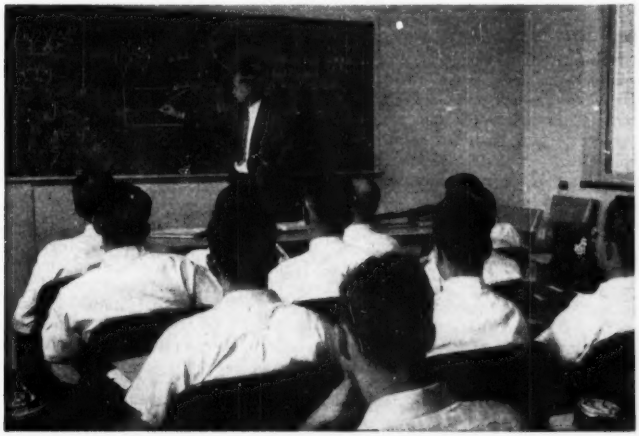
The lectures run from July to July, and normally five courses are given in the year. Each January or February the ball is set rolling by sending questionnaires to all technical and laboratory personnel, listing a number of subjects which might be given during the "academic" year. The men indicate which ones they would be most interested in, or write in subjects they want which are not listed. From these replies the curriculum is established for the following year.

A professor is invited to teach the course, and a class of a maximum of 16 is selected to attend. If more than 16 want the course, arrangements are made to repeat it. Course content is left to the professor, as is the length. Although two weeks is recommended, some have run three weeks. Tests are employed and marks given, all to concentrate the student's efforts.

Is It Worth It? Total cost of a year's lectures is estimated by the company at between $25,000 and $35,000. This is a fairly tidy sum for a project not directly connected with increasing production. But the company feels that it is a cheap price for the results.

Technical employees keep abreast of the times, and regain that freshness of approach so valuable in research work. Most of the information in the courses has developed since the employees left college, and it is brought to them by men who are already pushing farther ahead. There is a strong push to get out of the rut, to look ahead, in the mere association with these "pure" scientists—a push that can be of considerable advantage in applying their new knowledge to their work at Humble.

The advantages to the company are obvious. A live research staff is one of any company's greatest assets; and if nothing concrete at all came from the lectures Humble would not complain. Actually, some knotty, and immediate, problems have been solved in the lectures. One research man claims he saved two to three years work by merely finding out all the approaches to his problem that wouldn't work. For now, that is enough return; the dollars and cents come later.



NEW BLOOD: Expert lecturers jog brains from the rut of routine.

Cooperation for Safety

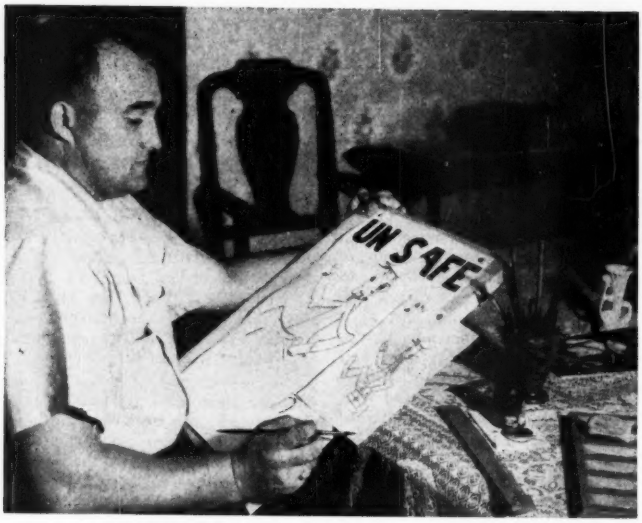
The University of Illinois Institute of Labor and Industrial Relations has paid tribute to another successful union-management committee for industrial safety. The committee, at A. E. Staley Mfg. Co.'s Decatur, Ill., plant, has reduced the accident rate from 19.0 to 6.4 per million man-hours in short five years of its existence.

The Staley committee, while similar to many other such groups throughout industry, has been noteworthily successful. Reason: concentration on making the safety program timely and local, rather than vague and general; and close cooperation between management and the union.

Home-Grown: When Lovell Bafford, permanent management member of the committee, took over as director of safety, he decided that the safety program was too impersonal, remote, and ill-timed to reach the workers effectively. Stock posters were the rule, but they failed to give the "personal" local touch he felt necessary to secure the cooperation of the employees. Worse, stock posters often emphasized the wrong thing at the wrong time. When falls were the problem, posters on care of the eyes would arrive, and vice versa.

The answer, the committee decided, was to have its own posters made locally. They found their supplier right in the company: Hilbert O. Bell, research chemist by profession, cartoonist by avocation. Now, when Bafford, in his position as head of the first aid department, reports the need to emphasize a particular local safety problem, the committee orders 100 posters from Bell. By placing 100 identical posters throughout the plant they get the desirable saturation effect.

Not only does such a method pinpoint local problems, but also secures the very helpful propaganda devices of familiarity and exclusiveness. These are posters no other plant can have, and the men tend to value them more than "canned" products—they get the feeling that the company is really interested in their safety to go to all the trouble of making special posters. As for familiarity, Bell's cartoon characters have become well known—they were used to illustrate the company safety manual—and the effect is similar to that obtained in the Army



CARTOONIST BELL: Personalized posters pack more punch.

by using Sad Sack posters to get across messages to the troops.

Labor's Concern Too: The United Automobile Workers' local at the plant first teamed with management in 1944 to form the present committee. The three labor members are elected annually, but the present three have worked so well they have been elected each year since 1945. Management is represented by Bafford.

All accidents, however minor, are written up, and monthly recaps pinpoint major trouble spots for cartoonist Bell to work on. Bafford reports on the current situation at supervisor meetings, provides bulletins outlining preventive measures that can be taken.

At every union meeting, safety is a top item on the agenda. Problems and the decisions of the committee are explained and discussed with a friendly informality impossible to secure with a unilateral program; viz., top management handing down directives.

In cases of serious injury, Bafford and one employee member of the committee investigate. They talk to the man, inspect the accident scene immediately after the accident has occurred, decide how to prevent a reoccurrence.

No Dictation: The committee does not dictate to management; both management and employees submit suggestions to the committee. The committee then studies the facts and ideas, makes its recommendations to the company management; but management is not bound to accept these suggestions without question. Instead they are balanced against need, cost, time, and production requirements, as any company project would be.

If a recommendation is turned down that the union feels to be necessary for the well-being of its members, it can be made the subject of grievance and bargaining procedures in the normal way, but such action is rare at Staley. And in the meantime many small problems of safety have been quietly and quickly handled without trouble, hard-feelings, or time-consuming union-management negotiations, too often removed from immediate problems.

EXPANSION . . . .

Niacin: Merck & Co., Inc., will soon complete a new niacin plant near Danville, Pa.; capacity: one million pounds per year. The new unit will not utilize coal tar-based sources but will utilize "materials which are almost limitless in supply"—presumably the methyl ethyl pyridine derived from acetaldehyde and ammonia.

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Olefin Polymers: Two million gallons per year of polybutene and 3.8 million gallons per year of propylene tetramer will be produced at Pan-Am Southern Corp.'s new plant at El Dorado, Ark. Pan-Am is a subsidiary of Standard Oil Co. of Indiana.

The polybutene unit is scheduled to be completed by Feb. 1952. The propylene tetramer unit will be provided by revamping the present polymerization facilities at El Dorado.

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Cellophane: T.C.F. of Canada, Ltd., is building a plant for the manufacture of cellophane at Cornwall, Ont. The unit will have a capacity of 7 million pounds per year and is scheduled to be in operation by the spring of 1953. T.C.F.'s parents are Courtaulds Ltd., Courtaulds (Canada), Imperial Chemical Industries Ltd., and British Cellophane. Courtaulds Ltd. has a financial interest in British Cellophane.

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Antibiotic: Abbott Laboratories is building a new $315,000 antibiotics finishing plant at N. Chicago, Ill. Carroll Construction Co. is the general contractor.

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Graphite: A 50% expansion in the production of graphite is indicated by the issuance of a temporary construction permit to the International Graphite & Electrode Co. at Niagara Falls, N. Y. This represents an approximate $5 million bite in the company's $10.6 million expansion program. Stone & Webster will be in charge of construction.

FOREIGN. . . . . .

Ammonium Sulfate: India's first major state-owned enterprise to be started since independence was granted, the $448 million Sindhri fertilizer factory in Bihar near New Delhi, has just gone into production. It is expected to have an annual output of 350,000 tons of ammonium sulfate by the gypsum process.

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South Africa: What is believed to be a large deposit of attapulgite—a hydrated silicate of magnesium and aluminum—has been discovered in the Transvaal. A deodorizing and decolorizing agent for animal and mineral oils, attapulgite could, according to the South African Council for Industrial and Scientific Research, play an important part in processing of wool fats for production of lanolin. At present South Africa imports fullers earth for this purpose.

Large phosphate deposits have also been discovered in the Eastern Transvaal, are being opened up by the South African government. Acquired by ISCO—the State iron and steel industry—the deposits also include high potash-containing black vermiculite.

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Philippines: Plans for extensive development of electrochemical and chemical industries are actively being

Drums —"Hard to Beat"

The same Continental fibre drums that serve industry so well are giving an equally good accounting of themselves in military service.

Continental drums give extra protection to dangerous, expensive or hard-to-handle articles for shipment anywhere. Their light tare weight cuts shipping costs. They load compactly and ride safely. The closures are tight and strong, but easy to open and close.

In addition to being rugged and durable, these drums can't be beat for appearance. They are neat and trim and feature quality printing or spray painting.

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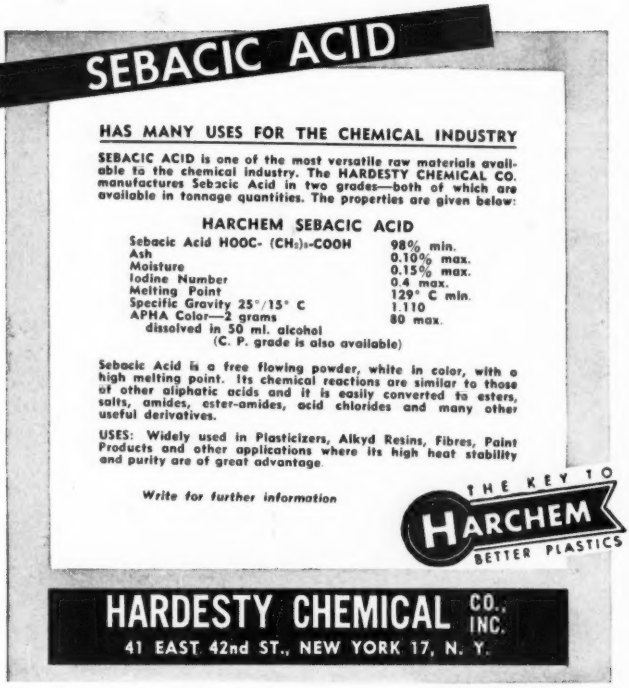
SEBACIC ACID
HAS MANY USES FOR THE CHEMICAL INDUSTRY
SEBACIC ACID is one of the most versatile raw materials available to the chemical industry. The HARDESTY CHEMICAL CO. manufactures Sebacic Acid in two grades—both of which are available in tonnage quantities. The properties are given below:
HARCHEM SEBACIC ACID
Sebacic Acid HOOC-(CH2)8-COOH 98% min.
Ash 0.10% max.
Moisture 0.15% max.
Iodine Number 0.4 max.
Melting Point 129° C min.
Specific Gravity 25°/15° C 1.110
APHA Color—2 grams dissolved in 50 ml. alcohol 80 max.
(C. P. grade is also available)
Sebacic Acid is a free flowing powder, white in color, with a high melting point. Its chemical reactions are similar to those of other aliphatic acids and it is easily converted to esters, salts, amides, ester-amides, acid chlorides and many other useful derivatives.
USES: Widely used in Plasticizers, Alkyd Resins, Fibres, Paint Products and other applications where its high heat stability and purity are of great advantage.
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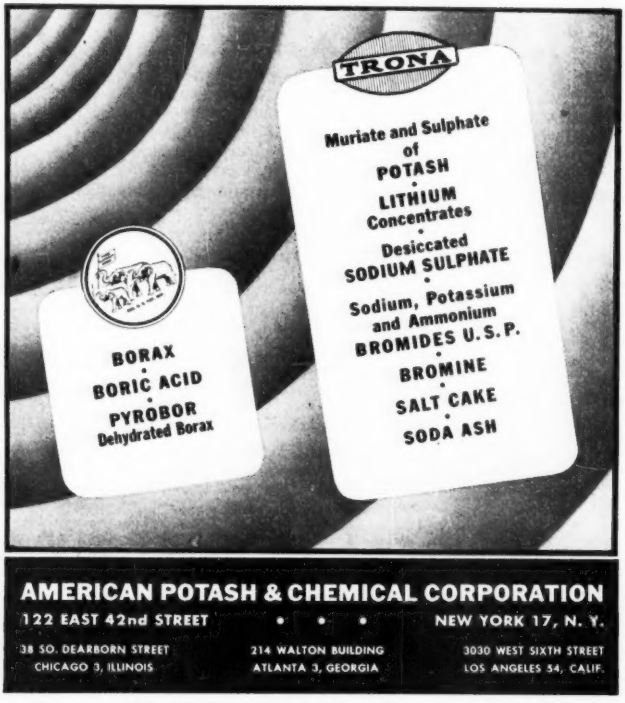

pushed now that hydroelectric projects are being constructed in strategic parts of the Islands. At Maria Cristina, the National Power Co. is already operating a fertilizer plant (estimated annual capacity: 50,000 metric tons of ammonium sulfate), and an adjoining sulfur dioxide plant is under construction.

FINANCE . . . .

Dow Chemical Co.: The Security Analysts of San Francisco were recently given a quick once-over on the expansion program which Dow is now carrying out.

Since the end of World War II Dow has spent an average of $59 million per year on plant expansion. But this figure has been more than doubled in the current fiscal year—to $125 million. This expansion should provide Dow with an annual sales volume of about $475 million by May, 1952.

To help in this bursting-at-the-seams expansion, Dow has applied for a total of $300 million in certificates of necessity, has received and is using $140 million. The rest are still pending.

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Jefferson Lake Sulphur Co.: Directors of Jefferson Lake have voted to split the $1 par common stock and authorized an increase in the common shares to a total of one million. The stockholders will be asked to approve of this action at a meeting on Dec. 12.

KEY CHANGES . .

Kenneth H. Klipstein: From director, NPA's Chemical Division to Assistant administrator, NPA's Chemical, Rubber and Forest Products Bureau, replacing Francis J. Curtis who is returning to his position as vice president and director, Monsanto Chemical Co.

Lawrence W. Strattner: From administrative vice president, West Virginia Pulp and Paper Co., to deputy assistant administrator, NPA's Chemical, Rubber and Forest Products Bureau.

Gifford Upjohn: From medical director to executive vice president, Upjohn Co.

C. V. Patterson: From director of production to executive vice president, Upjohn Co.

James A. Watkins, Jr.: From treasurer to vice president, Merchants Chemical Co.

Ralph T. Nazzaro: From director of research, Texon, Inc., to director of research, Westfield River Paper Co.

New Chemicals for Industry

On the following pages Chemical Week presents a tabulation of new chemicals and chemical specialties introduced since August, 1950.

Chemical and specialty products are listed separately in alphabetical sequence with technical descriptions, suggested uses and manufacturer's name.

For your convenience an alphabetical listing of manufacturers' addresses will be found at the rear of this report.

CHEMICALS

N-ACETYL-AMINOPHENOL

$HOC_6H_4NHCOCH_3$. M. W. 151. 16. m.p. 169° C. White powder., Sl. sol. water., Sol. alcohol., Suggested uses: Intermediate in chemical synthesis. Availability: Commercial quantities. Monsanto Chemical Co.

ACETYLENE DIUREINE

M.W. 142.12; Sp. G. 1.599 @ 20°/20°C.; decomp. 300°C.; insoluble in most organic solvnts; sol. in hot conc. HCl and H_2SO_4; sol. in water 1.5% by wt. @ 100°C.; white crystalline solid. Chemical Properties: Contains two ketone groups and four reactive hydrogens which may be condensed with formaldehyde to yield tetramethylol acetylene diureine. Uses: intermediate in preparation of compounds useful for crease-proofing and shrink-proofing of textile fibers. Availability: Research quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

ACRYLIC ACID (GLACIAL)

CH_2=CHOOH M.W. 72.06; Sp. G. 1.052@ 20°/20°C; B.P., 141.9°C. (760 mm.), 70°C. (50 mm.), 39°C. (10mm.); R.I., 1.4236 @ 20°C.; V.P. 3.4 mm. Hg @ 20° C.; Fr. P., 12.1° C.; Visc. 1.3 cps. @ 20° C.; Heat of vaporization, 257 B.t.u./lb. @ 1 atm.; completely soluble in water; colorless liquid. Chemical properties: polymerizes alone and copolymerizes with other ethylenic monomers. Can be esterified to make acrylic esters useful for preparing polymers and copolymers. Suggested uses: Pharmaceutical intermediate; preparation of specialty rubbers, pressure sensitive adheaives, laminating resins, thickening agents for natural and synthetic latices; preparation of coatings for textiles, paper, and leather; preparation of polyacrylic acid, an excellent nylon size. Availability: Research quantities for experimental use. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.; pilot-plant quantities, B. F. Goodrich Chemical Co.

ALKYLAMINE 81

t-C_{12}-$_{14}H_{29-30}$-NH_2. M.W., 185-227. Sp.G., 0.819 25°C./4°C. R.I., 1.4455, 25°C. B.P., 220-260°C., 760 mm. Flash point, 196°F., tag open cup. Chemical properties: Undergoes characteristic reactions of primary aliphatic amines. Suggested uses: Corrosion inhibitors, oil additives, surface active agents, bactericides, fungicides, textile finishing agents, ore flotation. Available in commercial quantities. Rohm & Haas Co.

ALKYLAMINE JM

t-$C_{18}H_{37}$ (average). M.W., 269 (average). Sp. G., 0.833, 25°C/4°C. R.I., 1.4569, 25°C. B.P., 120-1215° C.,15 mm. Flash point, 290° F., tag open cup. Chemical properties: Undergoes characteristic reactions of primary aliphatic amines. Suggested uses: Corrosion inhibitors, oil additives, surface active agents, bactericides, fungicides, textile finishing agents, ore floatation. Available in commercial quantities. Rohm & Haas Co.

ALKYLAMINE JM-T ACETATE

t-$C_{18}H_{37}NH_2OOCCH_3$ (average). Slightly alkaline, slightly viscous amber liquid. Soluble in water and organic solvents, including paraffin hydrocarbons. Surface active. Suggested uses: Cationic surface active agent and emulsifier, oil-soluble dispersing agent, ore flotation, bactericide, corrosion inhibitor, anti-static agent. Available in commercial quantities. Rohm & Haas Co.

2-AMINOBENZENETHIOL

$(H_2NC_6H_4SH)$ M.W. 125-18; colorless liquid; density, 1.168 g./cc. at 25°C.; R.I., n_D^{25} B.P., 227.2°C. (sl. dec.); F.P., 23 ±0.5°C.; 1.6390; flash point, (Tagliabue closed cup), above 80°C.; insoluble in water, moderately soluble in heptane and miscible with acetone, alcohol, carbon tetrachloride, dioxane, ethyl acetate and xylene. Chemical properties: Undergoes reactions typical of amino and mercapto groups, and where possible, reaction occurs at both groups forming cyclic thiazole or thiazine derivatives. Suggested uses: Mineral dressing agent, intermediate for pharmaceuticals, fungicides, bactericides, rubber chemicals and dyestuffs. Availability. Trial-lot quantities for experimental investigation. American Cyanamid Co.

2-AMINO-5-CHLOROPYRIDINE

$C_5H_5ClN_2$ M.W., 128.6; F.P., 135.0°C.; B.P. at 760 mm., 241.4°C.; sol. in 100 g. of H_2O at 20°C., 0.2 g.; purity, 95% minimum. Suggested uses: Starting material for the synthesis of myriad pyridine compounds. Available in research quantities. Reilly Tar & Chemical Corp.

2-AMINO-4,6-DIMETHYLPRIDINE

$C_7H_{10}N_2$ M.W., 122.17; F.P., 68.5°C.; B.P. at 760 mm., 235.3°C.; sol. in 100 g. water at 20°C., 5.53g.; purity, 95% minimum. Availability: Research quantities, commercial quantities may be had upon reasonable notice. Reilly Tar & Chemcal Corp.

AMMONIA—WATER—PHOSPHOROUS PENTOXIDE CONDENSATION PRODUCTS

White amorphorus solids. Two general varieties, water soluble and water insoluble forms. Suggested uses: Soluble variety—Cation sequestering agent; flame proofer for non-washable fabrics and paper. Insoluble variety—Flame proofer; source of slowly available nitrogen and phosphorus in specialty fertilizers. Availability: Soluble product—pilot-plant quantities; insoluble product—small quantities. Monsanto Chemical Co., Phosphate Division.

AMMONIUM METAPHOSPHATE

$(NH_4PO_3)_x$. M.W. on monomeric basis 97. Average analysis: NH3, 17.0-18.5%; P_2O_5, 72.5-74.0%; H_2O, 8.5-10.0%; 40-50g/100g water; Sequestering ability by Standard APHA soap test, 6.0-7.0; pH of 1% solution, 6.0-7.0; Bulk density, 23-25 lbs./cu. ft. Suggested uses: Water softening and general cation sequestering agent; detergent builder; specialty fertilizer; flame proofer for non-washable fabrics and papers. Availability: Pilot-plant quantities. Monsanto Chemical Co., Phosphate Division.

ARSENOUS IODIDE

AsI_3. M.W. 455.67. Red or orange crystals or yellow powder; soluble in water with hydrolysis; soluble in organic solvents, e.g., alcohol, ether, chloroform. Suggested uses: Medicinal, analytical, chemistry. Availability: Laboratory-scale. City Chemical Corp.

BARIUM SULFAMATE

$Ba(NH_2SO_3)_2$ M.Wt. 329.5 White crystalline powder; soluble in water; decomposed by sulfuric acid and soluble sulfates. Availability: Pilot-plant scale. City Chemical Corp.

2-BENZYLPYRIDINE

$C_{12}H_{11}N$. M.W., 169.16; B.P. at 760 mm., 276.8°C.; F.P., 13.6°C.; density 20°/20°C., 1.062; refractive index at 20°C., nD, 1.5797; sol. in 100 g. of H_2O at 20°C., 0.14 g.; purity, 98% minimum. Suggested uses: Intermediate in the synthesis of anti-histamine drugs. It is also important in the synthesis of various alkaryl pyridine compounds. Available in drum quantities. Reilly Tar & Chemical Corp.

4-BENZYLPYRIDINE

$C_{12}H_{11}N$. M.W., 169.16; B.P. at 760 mm., 291.1°C., F.P., 11.6°C.; density at 20°/20°C., 1.067; refractive index at 20°C., nD, 1.5825; sol. in 100 g. of H_2O at 20°C., 0.14 g.; purity, 95% minimum. Suggested uses: Synthesis of insecticides. Available in drum lots. Reilly Tar & Chemical Corp.

BERYLLIUM PHOSPHATE

$Be_3(PO_4)_2$. $7H_2O$ M. W. 343.1 (Berrylium Orthophosphate) White powder; insoluble in water, soluble in mineral acids. Availability: Laboratory scale. City Chemical Corp.

1-3 BIS (o-ETHYL PHENYL) GUANIDINE

o-Ethyl phenyl analog of diphenylguanidine; finely divided white powder with low bulk density; M.W. 267.38; M.P. 160.4°C. Soluble in mineral acids to form stable salts; moderately soluble in alcohol and insoluble in water. Suggested uses: Rubber accelerator and as a new commercial guanidine. Availability: Pilot-plant product. Monsanto Chemical Company.

2-BROMOPYRIDINE

C_5H_4NBr. M.W., 158.0; B.P. at 760 mm., 194.8°C.; density at 20°/20°C.; 1.627; refractive index at 20°C. nD, 1.5714; sol. in 100 g. water at 20°C., 2.08; sol. of water in 100 g. at 20°C., 1.3; purity, 95% minimum. Suggested uses: Starting material for the synthesis of pyridine compounds, e.g., pyridylmercantans, cyanopyridine, pyridyl-lithium, dipyridyl, pyridyl-alkanol-amines, hydroxypyridine, aryloxy- and alkyloxypyridines, pyrvidylhydrazine, substituted aminopyridines, etc. Available in research quantities. Reilly Tar & Chemical Corp.

BROMOTRIFLUOROMETHANE

CF_3Br, M.W., 149; B.P., -58°C.; F.P., -166°C.; crit. temp., 67°C.; Sp. G. (liq.), 1.94 @ -54°C.; heat of vap., 5,364 col/mol @ B.P.; colorless, odorless gas. Chemical properties: Essentially inert chemically and physiologically. Applications: Fire extinguishing agent. Low temp. refrigerant. Inert atmosphere. Availability: Pilot-plant quantities. Minnesota Mining & Manufacturing Co.

3-BUTOXYBUTRIC ACID

$C_4H_9OC_3H_6COOH$. M.W., 160.21; Sp. G., 0.9670 @ 20/20°C.; B.P., 165°C. (50 mm.), 130°C. (10 mm.); V. P., less than 0.1 mm. Hg. @ 20° C.; F. P., sets to a glass below -90°C.; visc., 12.7 cps. @ 20°C.; R.I., 1.4256 @ 20°C., sol. in water, 1.8% by wt. @ 20°C.; sol. water in, 10.5% by wt. @ 20°C.; colorless liquid. Chemical properties: Undergoes reactions typical of organic acids. Uses: Intermediate for the preparation of plasticizers, varnish dryers, synthetic flavors, and pharmaceuticals. Availability: Research quantities. Carbide and Carbon Chemicals Co., Division of Union Carbide and Carbon Corp.

BUTYL ACETOXY-STEARATE (PARICIN® 6)

$C_{24}H_{48}O_4$. Avg. M.W. 390; bright, clear, low viscosity liquid, free from moisture and suspended matter. Viscosity 32 centipoises @ 25°C.; density 7.71 lb/gal @ 15°C.; acid value 4.0; sap. value 274. Suggested uses: Plasticizer; textile oil; adhesives; specialties. Available in commercial quantities. The Baker Castor Oil Co.

N-BUTYL DIETHANOLAMINE

$C_4H_9N(C_2H_4OH)_2$. M. W., 161.24; Sp. G., 0.972 @ 20/20°C.; distillation range, 270-275°C. (760 mm.); flash pt., 260°F. (Cleveland Open Cup). Chemical properties: Undergoes reactions characteristic of tertiary amines and primary alcohols. Suggested uses: In the preparation of cationic surface-active agents, synthetic resins, pharmaceuticals, and dyestuffs. Availability: Research quantities for experimental use. Carbide and Carbon Chemicals Co., Division of Union Carbide and Carbon Corp.

1, 3-BUTYLENE GLYCOL

$C_4H_8(OH)_2$ M.W., 90.12; Sp. G., 1.0062 @ 20°/20°C.; R. I. 1.4370 @ 20°C.; B. P. 207.5°C. (760 mm.); sol. in water, complete; odor, sweet, mintlike; color, water white. Its low toxicity suggests its application to replace and complement other glycols and glycerine. Suggested uses: Textile lubricants, alkyds and polyester resins, hydraulic fluids, steam set inks, cosmetics, elastomers, and specialty soaps; of particular interest for phthalic, maleic and fumaric alkyd resins, and polyesters for plasticizers, coatings, laminates. Commercially available. Celanese Corp. of America, Chemical Division.

2, 3-BUTYLENE GLYCOL

$C_4H_8(OH)_2$ M.W., 90.12; Sp. G., 1.0093 @ 20°/20°C., R. I. 1.4377 @ 20°C.; B. P. 182°C. (760 mm.); sol. in water, complete; odor, sweet; color, water white. Exists in three stereo isomeric forms, dextro, levo, and meso, and is produced as a mixture of 85% meso and 15% dextro-levo; adjacent hydroxyl groups of this glycol offer interesting possibilities as a chemical intermediate. Other suggested uses: Production of polyesters and alkyd resins; high boiling point, excellent solvent and hygroscopic properties make it of interest for steam-set inks, plasticizers, pastes, dyes and specialty soaps. Commercially available. Celanese Corp. of America, Chemical Division.

N-BUTYL ETHANOLAMINE

$C_4H_9NHC_2H_4OH$. M.W. 117.19; Sp. G., 0.8932 @ 20/20°C.; B. P., 198.7 (760 mm.); V. P., 0.08 mm. Hg @ 20°C.; Fr. P., -2.1°C.; sol. in water, complete @ 20°C.; visc., 20.2 cps. @ 20°C.; R. I., 1.4435 @ 20°C. Chemical properties: Undergoes typical reactions of secondary amines and primary alcohols. Suggested uses: Intermediate for the preparation of textile finishing compounds, emulsifying agents, dyestuffs, resins, and pharmaceuticals. Availability: Research quantities for experimental use. Carbide and Carbon Chemicals Co., Division of Union Carbide and Carbon Corp.

BUTYL ETHYL "CELLOSOLVE"

$C_4H_9OC_2H_4OC_2H_5$. M.W. 146.22; Sp. G., 0.8389 @ 20/20°C.; B.P. 164.2°C. (760 mm.), 85°C. (50 mm.), 52°C. (10 mm.); R.I. 1.4044 @ 20°C.; V.P. 1.5 mm. Hg @ 20°C.; F.P. -90°C. (sets to a glass); visc., 0.9 cps. @ 20°C.; sol. in water, 1.4% by wt. @ 20°C.; sol. of water in, 1.0% by wt. @ 20°C. Uses: Inert reaction medium, extractant, heat transfer medium, mutual solvent and coupling agent, solvent for halogenated hydrocarbons and inorganic halides such as stannous chloride. Availability: Research quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

4, 4'-BUTYLIDENEBIS (6-tert BUTYL-m CRESOL)

M.W. 382.56; white powder. M.P. 210.2-210.9° C. Soluble in methanol, ethanol, acetone, dioxane, ethyl ether and benzene; insoluble in water, petroleum ether, and heptane. Suggested uses: Nonstaining antioxidant for rubber and synthetic elastomers. Availability: Research quantities. Monsanto Chemical Company.

CADMIUM POTASSIUM CHLORIDE

$CdCl_2.KCl.H_2O$ M.Wt. 276.0 White crystals. Soluble in water without decomposition Availability: Pilot-plant scale. City Chemical Corp.

CADMIUM POTASSIUM IODIDE

$CdI_2.2KI.2H_2O$. M.W. 734.31. White, deliquescent crystals. Soluble in water and alcohol Suggested uses: analytical chemistry, medicine. Availability: Pilot-plant scale. City Chemical Corp.

CADMIUM RICINOLEATE

Fine, white powder. Odorless, or having only a slight odor of fatty acid. M.W. 702.5; M.P. 104°C; Bulk Density .38 gr/cc; Sp. Gr. 1.11@ (25°/25°C); 100% passing 40 mesh sieve. Suggested uses: stabilizer for vinyl resins; mildew proofing; waterproofing. Availability semi-commercial quantities. The Baker Castor Oil Co.

CALCIUM ACRYLATE

A monomeric material containing approximately 90% calcium acrylate, 4% other calcium, and 3% water. Supplied as a free-flowing powder, without inhibitor. Used for soil solidification in military roads, airstrips, etc. Availability: Pilot-plant quantities. Rohm & Haas Co.

CALCIUM ACRYLATE DIHYDRATE

M.W. 218.22; Sp. G. of 20% aqueous soln., 1.091 @ 20/20°C.; R.I. of 20% aqueous soln., 1.3688 @ 20°C.; visc. of 20% aqueous soln., 2.48 cps. @ 20°C.; purity of material, 95% calculated as calcium acrylate dihydrate; pH of saturated soln. in water, 9.0 @ 25°C.; surface tension of saturated soln, in water, 56.7 dynes/cm. @ 25°C.; white free-flowing powder. Chemical properties: Polymerizes alone and copolymerizes with other monmers o ntaining the ethylenic linkage. Uses: Water-soluble monomer useful for stabilization of clay-type soils. Availability: research quantities. Carbide and Carbon Chemicals Co. Division of Union Carbide and Carbon Corp.

CALCIUM DICHROMATE

$CaCr_2O_7.4\frac{1}{2}H_2O$. M.W. 337.17; D, 2.136; solubility in water, 78.4% at 30°C; transition to $CaCr_2O_7.3H_2O$ at 42.1°C. Chemical properties: Similar to sodium bichromate; precipitation occurs on heating unless pH is below 0.7; decomposes with loss of oxygen at 400 to 500°C., going to $CaCrO_4$ at 1200°C. Suggested uses: Similar to other dichromates, in systems where sodium, potassium or ammonium salts may not be used, or where calcium is specifically required; in metal surface treatments as a dip after phosphating. Availability: Pilot plant scale. Mutual Chemical Co. of America

CALCIUM RICINOLEATE

Fine, white powder; odorless, or having only a slight odor of fatty acid. M.W. 630; M.P. 98°C; Bulk Density .39 gr/cc; Sp. Gr. 1.04 @ (25°/25°C); 97% passing 200 mesh sieve. Suggested uses: Metal drawing; grinding aid; antiblocking agent; greases; waterproofing agent; stabilizer for vinyl resins. Availability: Commercial quantities. The Baker Castor Oil Co.

CARBON TETRAFLUORIDE

CF_4. M.W., 88; B.P., —128°C.; F.P., —180°C.; Crit. Temp., —47°C.; Sp. G., 1.62 @ —128°C. Colorless, odorless gas. Chemical properties: Inert gas; can be heated to 1,000°C. in presence of water and oxygen without decomposition; physiologically inert. Applications: Refrigerant for very low temperatures; inert atmosphere; gaseous dielectric. Availability: Pilot-plant quantities. Minnesota Mining & Manufacturing Co.

5-CHLOROSALICYLIC ACID

$C_6H_3(OH)(Cl)COOH$. M. W., 172.57; Appearance, white needle-like crystals; M.P., 173°-174°C.; v. sl. soluble in cold water; soluble in hot water; Chemical properties: The carboxyl and hydroxyl groups may enter into the typical reactions of such groups to yield esters, ethers and the like. Suggested uses: In the synthesis of dyes, insecticides, pharmaceuticals, and other organic chemicals; as a carrier to deepen and level shades in the dyeing of nylon and Dacron. Availability: pilot-plant quantities. Heyden Chemical Corp.

CHROMIC NITRATE

$Cr(NO_3)_3.9H_2O$. M.W., 400.18; D, 1.80; M.P., 60.3°C. Small rhomic crystals, deep violet, deliquescent. Sol. in water, 74.6% at 25°C; Solution dark green when hot, changing quickly to dark blue-violet on cooling; solution loses HNO_3 slowly above 45°C., becoming basic; by addition of alkali, solution may be adjusted to any desired basicity up to 80% without precipitation. Chemical properties: Reactions are characteristic of trivalent chromium compounds; on firing it completely decomposes leaving a bright green residue of pure Cr_2O_3. Suggested uses: In mordants, for textile dying and printing; in tanning and protein insolubilization processes; in low temperature vitreous enamels and glazes; in the preparation of catalysts and derived chromium compounds. Availability: Pilot plant scale. Mutual Chemical Company of America

CLAY, AIKEN

White to Cream, grit free, hard Carolina clay. 99% thru 300 mesh, moisture not over 0.5%. Suggested uses: Suitable for rubber and plastic compounding; with natural and synthetic rubbers it does not retard cure; it stiffens and reinforces both cured and uncured stocks, prevents sagging. Suggested uses: In manufacture of wire insulation, tubing, mechanical goods, drug sundries, foot wear, mats, tile, etc. Commercially available. The C. P. Hall Co. of Illinois

COBALTOUS OXALATE

$COC_2O_4.2H_2O$. M.W. 182.97; rose-colored powder; insoluble in water, soluble in diluted mineral acids, ammonia and alkali oxalates. Suggested use: ceramics. Availability: pilot plant scale. City Chemical Corp.

COBALTOUS SULFATE, ANHYDROUS

Rose-colored powder; soluble in water. Suggested uses: Ceramics, pigments. Availability: Laboratory-scale. City Chemical Corp.

2,4,6,-COLLIDINE

$C_8H_{11}N$ M.W., 121.18; F.P., —44.5°C.; B.P. at 760 mm., 170.4°C.; density at 20°/20°C., 0.913 g/cc.; refractive index at 20°C., nD, 1.4981; sol. in 100 g. water at 20°C., 3.6 g.; sol. of water in 100 g. at 20°C., 85 g.; purity, 97.5% minimum. Availability: Ton lots. Suggested uses: In conjunction with 2,4-lutidine, used for the chromatographic assay of amino acids; also a dehydrohalogenating agent. Reilly Tar & Chemical Corp.

CUPRIC ARSENATE

Blue powder of variable composition; insoluble in water and alcohol; soluble in dilute mineral acids and ammonia. Suggested use: Insecticide. Availability: Pilot plant scale. City Chemical Corp.

CUPRIC BORATE

Blue powder; insoluble in water; decomposed by mineral acids. Suggested uses: Pigment, insecticide. Availability: Pilot plant scale. City Chemical Corp.

4, 4' DIAMINO DIPHENYL SULFONE

$H_2NC_6H_4SO_2C_6H_4NH_2$. M.W., 248.3, Assay 99-100%, M.P. 165-170°C sol. in water, 0.025% @ 25°C., sol. acetone, ethanol; color, light brown powder. Chemical properties: Amino groups react normally to yield compounds stabilized by sulfonyl linkages. Suggested uses: In the synthesis of dyes, pharmaceuticals, ion-exchange resins, and other organic chemicals. Availability: Small research quantities. Monsanto Chemical Co. Merrimac Division.

DIANISIDINE DIISOCYANATE

$OCN.CH_3O.C_6H_3$ — $C_6H_3CH_3O.NCO$. M.W. 296.7; amine equivalent, 148 (grams of diisocyanate per gram mole of secondary amine); melting point, 121-122°C. Insoluble in water, decomposes slowly on exposure; 15% solubility in carbon tetrachloride at 75°C. Container, 2-oz. bottle. Suggested uses: Cross-linking agent for polymers, ingredient in foamed resins and adhesives, preparation of copolymers with diols and diamines. Availability: Laboratory quantities. Monsanto Chemical Co. Phosphate Division.

DIBUTYLAMINOETHANOL

$(C_4H_9)_2$ NC_2H_4OH. Equivalent weight, 170 (approx.); boiling range, 188-232°C.; Sp. gr. @ 20°C., 0.85-0.86; Color, straw. Suggested uses: emulsifier intermediate. Availability: Semi-commercial quantities. Sharples Chemicals Inc.

N,N-DIBUTYL ETHANOLAMINE

$(C_4H_9)_2NC_2H_4OH$. M.W., 157.29; Sp. G., 0.8615 @ 20/20°C.; B.P., 229.7°C. (760 mm.), 141°C. (50 mm.), 102°C. (10 mm.); V. P., 0.11 mm. Hg @ 20°C.; Fr. P., sets to a glass

below —75°C; sol. in water, 0.39% by wt. @ 20°C.; sol. water in, 6.8% by wt. @ 20°C.; Visc., 7.7 cps @ 20°C.; R. I., 1.4438 @ 20°C. Chemical properties: Undergoes reactions characteristic of tertiary amines and primary alcohols. Suggested uses: Intermediate for textile finishing compounds, synthetic resins, pharmaceuticals, and dyestuffs. Availability: Research quantities for experimental use. Carbide and Carbon Chemicals Co. a Division of Union Carbide and Carbon Corp.

DIBUTYL HYDROGEN PHOSPHITE

$(C_4H_9O)_2POH$. M.W., 194.2; Sp. G., 0.995 at 20°/4°C.; R.I., 1.4238 at 20°C.; B.P. 118-9°C. (7 mm); sl. sol. in water, slowly hydrolyzes, miscible with alcohol, ether, hexane and most of the common organic solvents; flash point, 120°C.; fire point, 150°C.; odor, mild, pleasant; colorless liquid. Chemical Properties: Undergoes selective reactions with organic and inorganic reagents and is useful in preparing phosphates, phosphonates, thiophosphates, pyrophosphites, hypophosphates, and other organic compounds of phosphorus for use in dyestuffs, pesticides, pharmaceuticals, lubricants, and plastics. Availability: Semi-commercial quantities. Virginia-Carolina Chemical Corp.

DIBUTYL PHOSPHITE

$(C_4H_9O)_2POH$. M.W. 194; B.P. 72°C. at 0.5 mm; R.I. $n^{25}D$ 1.4228. Sp. gr. 0.986 at 25/4°C; water-white liquid. Chemical properties: The active hydrogen reacts with alkaline metals as well as with chlorine; also adds to certain organic double bonds. Suggested uses: Intermediate in organic synthesis, solvents, reducing agents. Availability: Semicommercial quantities. Victor Chemical Works.

DICARBOXYLIC ACIDS, MIXED HIGHER

A uniform mixture of suberic, azelaic and sebacic acids. White Crystalline powder, practically insoluble in water, soluble in alcohols, etc. Suggested uses: Manufacture of esters, metallic salts, amides and other organic chemicals. For use as plasticizers, driers, alkyd resins, low temperature lubricants, dyestuffs, etc. Availability: Semi-commercial quantities. The C. P. Hall Co. of Illinois.

DICARBOXYLIC ACIDS, MIXED LOWER

A uniform mixture of adipic, glutaric and pimelic acids. White crystalline powder, odorless, practically insoluble in water, solubie in alcohols, etc. Suggested uses: Manufacture of esters, metallic salts, amides, and other organic chemicals. For use as plasticizers, driers, alkyd resins, low temperature lubricants, dyestuffs, etc. Availability: Semi-commercial quantities. The C. P. Hall Co. of Illinois

DICYCLOHEXYL KETONE

M.W. 194.31; Sp. G., 0.950 @ 30.5/20°C.; R.I., 1.4804 @ 30.5C.; B.P., 149.6°C. (18 mm.); F.P., 12.4°C. Chemical properties: May be hydrogenated to form corresponding alcohol, may be condensed with amines and reactive methylene groups. Uses: Pharmaceutical intermediate. Availability: Research quantities. Carbide and Carbon Chemicals Co. Division of Union Carbide and Carbon Corp.

DIETHYL FUMARATE

$C_2H_5OCOCH{=}CHCOOC_2H_5$ M.W., 172.18; Sp. G., 1.0529 @ 20/20°C.; B.P., 216.9 (760 mm.); V. P., 0.1 mm Hg @ 20°C.; Fr. P., 1.0°C., Visc., 2.9 cps. @ 20°C.; sol. in water, 0.40% by wt. @ 20°C.; sol. water in, 1.13% by wt. @ 20°C.; white crystalline solid. Chemical properites: Undergoes reactions characteristic of compounds containing the ethylenic linkage. Copolymerizes with other unsaturated monomers in presence of peroxide catalysts. Uses: Copolymerization, resin modification. Availability: Research quantities. Carbide and Carbon Chemicals Co. Division of Union Carbide and Carbon Corp.

DI-2-ETHYLHEXYL PHOSPHITE

$(C_8H_{17}O)_2POH$. M.W. 306. B.P. 150-155° C at 2-3 mm. Sp. gr., 0.929 at 25/4°C. R.I., $n^{25}D$ 1.4418. A water white liquid. Chemical properties: Active hydrogen reacts with alkali metals and chlorine. Uses: Intermediate for organic synthesis, solvents, oil additives. Availability: Semicommercial quantities. Victor Chemical Works.

DIETHYL PHOSPHITE

$(C_2H_5O)_2POH$. M.W. 138. B.P. 50-51° C. at 2 mm. Sp. gr. 1.069 at 25/4°C. R.I., n^{25}_D 1.4061. A water white liquid. Chemical properties: Reacts with sodium to form diethyl sodiophosphite, with chlorine to form diethyl chlorophosphate; Active hydrogen atom adds to some types of double bonds in organic compounds forming phosphorus to carbon linkage. Uses: Intermediate in organic synthesis, reducing agent, solvents. Availability: Semicommercial quantities. Victor Chemical Works.

DIHYDROPYRAN

$CH_2CH_2CH_2CH{:}CH{\bullet}O$. M.W. 84.114; colorless liquid; ether-like odor; Sp. G., 0.923 @ 20°/4° C.; R.I., 1.4400 @ 20°C.; B.P. 86°C. (760mm.); Reid Vap.P., 3.3 p.s.i.; flash pt. (Tag closed cup), 0°F.; sol. in water, 3% by wt. @ 25°C.; miscible with common organic solvents. Chemical properties: Through reactions of the double bond, it combines with such widely varied materials as hydrogen, water, alcohols, glycols, halogens, hydrogen halides and phosgene. Uses: Chemical intermediate. Availability: Semi-commercial quantities. E. I. du Pont de Nemours & Co.

1,4-DIHYDROXY NAPHTHALENE

M.W. 160.1. Grey crystalline solid of good purity. Soluble in alcohol, ether, acetone and glacial acetic acid. Sl. sol. in hot water. Uses: As a pharmaceutical intermediate. Availability: Experimental quantities. National Aniline Division, Allied Chemical & Dye Corp.

DIMETHOXY TETRAETHYLENE GLYCOL

$CH_3O(CH_2CH_2O)_4CH_3$ M.W. 222.28; Sp. G., 1.0132 @ 20/20°C; R.I., 1.4336 @ 20°C.; B.P. 275.3°C (760 mm); miscible with both water and hydrocarbons; odor, mild, etheral; color, water white. Chemical Properties: There is no active hydrogen atom so, therefore, is recommended as a solvent for Grignard and sodium condensation reactions. Suggested uses: In organic synthesis as a solvent for Grignard and sodium condensation reactions. Suggested uses: In organic synthesi as a solvent; as a selective solvent for such gases as methyl chloride, sulfur dioxide, acetylene, etc.; as an additive for Diesel fuels to reduce the auto-ignition temperature of the fuel. Availability: Pilot plant quantities. Ansul Chemical Co.

DI-iso-OCTYL PHENYLPHOSPHONATE

$C_6H_5PO(OC_8H_{17}/_2$ M.W. 382. M.P., below 0°C. B.P., 180-190°C. (1 mm.). Sp. G. 0.973 at 25°C. R.I. $n^{25}D$ 1.4789. A water white neutral ester, insoluble in water but miscible in all proportions with the common organic solvents; relatively stable to hydrolysis, particularly in alkaline media. Suggested uses: Plasticizers, lubricants, or hydraulic fluids. Availability: Semicommercial quantities. Victor Chemical Works.

DI-iso-OCTYL STYRYLPHOSPHONATE

$C_6H_5C_2H_2PO(OC_8H_{17}/_2$. M.W. 408. M.P. below 0°C. B.P., 185-190°C. at 1 mm. Sp. G. 0.977 at 25°C. R.I., $n^{25}D$ 1.4994. A yellow, slightly viscous neutral ester, insoluble in water but miscible in all proportions with the common organic solvents; relatively stable to hydrolysis, particularly in an alkaline medium. Suggested uses: Plasticizers, lubricants, or hydraulic fluids. Availability: Semicommercial quantities. Victor Chemical Works.

DI-N-PROPYLTHIONOCHLOROPHOSPHATE

$(n\text{-}C_3H_7O)_2PSCl$. M.W. 216.67 Sp. G. 1.123 at 25/4°C. B.P., 70-75°C. at 1 mm. R.I., $n^{25}D$ 1.4672. A water white liquid; quite stable to water at ordinary temperatures. Suggested uses: Intermediate for organic synthesis. Availability: Semicommercial quantities. Victor Chemical Works.

DI-2-ETHYLHEXYL HYDROGEN PHOSPHITE

$(C_8H_{17}O)_2POH$. M.W., 306.4; Sp. G., 0.937 at 20°/4°C.; R.I., 1.4423 at 20°C.; B.P., 163-4°C. (3 mm); insol. in water, very slowly hydrolyzes, miscible with alcohol, ether, hexane and most of the common organic solvents; flash point, 165° C.; fire point, 205°C.; odor, mild suggestive of octyl alcohol; colorless liquid. Chemical Properties: Undergoes selective reactions with organic and inorganic reagents and is useful in preparing phosphates, phosphonates, thiophosphates, pyrophosphites, hypophosphates, and other organic compounds of phosphorus for use in dyestuffs, pesticides, pharmaceuticals, lubricants, and plastics. Availability: semi-commercial quantities. Virginia-Carolina Chemical Corp.

DIETHYL HYDROGEN PHOSPHITE

$(C_2H_5O)_2POH$. M.W., 138.1; Sp. G., 1.079 at 20°/4°C.; R.I., 1.4073 at 20°C.; B.P. 65-6°C. (6 mm); sol. in water, hydrolyzes, miscible with alcohol, ether, hexane and most of the common organic solvents; flash point, 90°C.; fire point, 105°C.; odor, mild, pleasant; colorless liquid. Chemical Properties: Undergoes selective reactions with organic and inorganic reagents. Suggested uses: Preparation of phosphates, phosphonates, thiophosphates, pyrophosphites, hypophosphates, and other organic compounds of phosphorus for use in dyestuffs, pesticides, pharmaceuticals, lubricants and plastics. Available in semi-commercial quantities. Virginia-Carolina Chemical Corp.

2,2 DIETHYL PROPANEDIOL-1, 3

$HOCH_2C(C_2H_5)_2CH_2OH$. M.W., 132.20; Sp. G., 0.949 @ 61.3°/20°C.; B.P., 125°C. (10 mm.); Fr. P., 61.3°C.; sol. in water, 25% by wt. @ 20°C.; white, crystalline solid. Chemical properties: The two primary hydroxyl groups undergo the characteristic reactions of alcohols. Suggested uses: Anticonvulsant; intermediate for the preparation of plasticizers, synthetic lubricants, and emulsifying agents. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

DIETHYL SUCCINATE:

M.W. 174.2; Acidity (as succinic acid), 0.1% maximum; appearance and color, essentially colorless, clear, mobile liquid; assay 99%; B.P., 120°C. at 30 mm. Hg; crystallizing point, approx. -20°C.; odor, slight; R.I. n^{20}_D 1.417-8; Sp. g. at 25°C./25°C., 1.037-9; solubility, insoluble in water, soluble in alcohol, ether and petroleum spirits; Weight per U.S. Gallon, 8.7 lbs. at 25°C. Availability: Pilot-plant quantities. Monsanto Chemical Co.

DIGLYCOL DIACETATE

$CH_3COOCH_2CH_2OCH_2CH_2OCOCH_3$ M.W. 190.19; Sp. G., 1.1159 @ 20/20°C.; B.P., 250°C. (760 mm.); V.P.,<0.01 mm. Hg @ 20°C.; Fr. P., 19.1°C.; Visc., 6.9 @ 20°C.; R.I., 1.4303 @ 20°C.; sol. in water, complete @ 20°C.; Fl. P., 225°F. (Cleveland Open Cup). Suggested uses: High boiling, slow evaporating solvent for cellulose ester printing inks and lacquers. Availability: semi-commercial quantities. Carbide and Carbon Chemicals Co., Division of Union Carbide and Carbon Corp.

DI-N-HEXYL MALEATE

M.W., 284.38; Sp. G., 0.9602 @ 20/20°C.; B.P., 179°C. (10 mm.), 142°C. (1.0 mm.), (0.1 mm.); R.I., 1.449 @ 20°C.; V.P.,<0.01 mm. Hg @ 20°C., Fr. P., -70°C. (glass below this temperature); Visc., 10.2 cps. @ 20°C.; sol. in water,<0.01% by wt. @ 20°C.; sol. of water in, 0.3% by wt. @ 20°C. Chemical properties: Polymerizes or copolymerizes with other monomers to form resins; readily adds halogens to the double bond; undergoes Diels-Alder reaction with conjugated dienes; forms sodium bisulfite addition product. Uses: Preparation of resins for use in coatings, films, molded products, and textile specialties. Available in commercial quantities. Carbide and Carbon Chemicals Co., Division of Union Carbide and Carbon Corp.

DIMETHYL HYDROGEN PHOSPHITE

$(CH_3O)_2POH$. M.W. 109.99; water white mobile liquid; B.P., 71°C. at 25 mm; density at 20°C. compared with water at 0°C., 1.204; refractive index at 20°C., 1.4036; viscosity, 1.006 centistokes at 27°C.; thermal stability, good; odor, mild; soluble in water, hydrolyzes; soluble in alcohol, benzene; insoluble in hexane; Suggested uses: Intermediate to phosphonate esters and phosphoric acids; on reaction with halophosphites, the salt can lead to pyrophosphites; can be chlorinated to the chlorophosphate which can lead to the phosphate or hypophosphate. Availability: Pilot-plant quantities. Monsanto Chemical Co., Phosphate Division.

DINONYL PHENOL

M.W., 346; Sp. G. 0.914, 25°C./4°C.; Distillation range, 92% between 180-220°C., 10 mm. Availability: Pilot-plant quantities. Rohm & Haas Co.

DIPENTEX DIFORMAL

$[C([CH_2O]_2CH_2)(CH_2OH)CH_2-]_2O$. M.W., 278.30; white powder; Congeal. Pt.; soluble in alcohol; v. sl. soluble in benzene. Chemical properties: Under the influence of heat and a strongly acidic catalyst, formaldehyde may be liberated from Dipentex diformal; the two free primary hydroxyl groups are capable of undergoing esterification. Suggested uses: For the preparation of esters for use as waxes; as a latent source of formaldehyde without the liberation of water; in the synthesis of various organic chemicals. Availability: pilot-plant quantities. Heyden Chemical Corp

DIPHENYLACETIC ACID

$(C_6H_5)_2CHCOOH$. M.W., 212.24; B.P., sublimes; M.P., 147.8°C.-148.2°C.; odor, none; appearance, colorless crystals. Chemical properties: Active methylene group; source for diphenylacetyl group. Suggested uses: In the synthesis of antispasmodics and morphine substitutes and generally in the synthesis of pharmaceutical and other organic chemicals. Availability: commercial quantities. American British Chemical Supplies, Inc., Kay-Fries Chemicals, Inc.

DIPROPYLENE GLYCOL MONOESTER OF SALICYLIC ACID

Light-colored oil having a faint characteristic fragrant odor. It has the property of absorbing ultra-violet light completely from 2890 A to 3000 A. Density at 40°C.1.16; R.I., 152 ca; pH of 10% aqueous dispersion—5.0; insoluble in water but dispersable in presence of emulsifiers; insoluble in mineral oil but soluble in 95% mineral oil to which 5% propylene glycol monolaurate has been added. soluble in cold methanol, 80% aqueous ethanol, t-butanol, ethylene glycol, propylene glycol, diethylene glycol, propylene glycol monomethyl ether, and acetone. Suggested uses: Ultra-violet light screening agents, plasticizer, stabilizer, for plastics, protective coatings, protective polishes, nitro-cellulose lacquers, insecticidal compositions, dyed and colored fibre, paper, leather, etc. Availability: Commercially available. Colgate-Palmolive-Peet Co., Organic Chemicals Division.

2,2'-DIPYRIDYLAMINE

$C_{10}H_9N_3$ M. W., 171.2; F.P., 95.3°C. B.P. at 50 mm., 222°C.; sol. in 100 g. water at 20°C., less than 0.5 g.; purity, 98% minimum. Available in research quantities or drum lots. Reilly Tar & Chemical Corp.

DITHIOSALICVLIC ACID

$COOH\text{-}C_6H_4\text{-}S_2\text{-}C_6H_4\text{-}COOH$. M.W. 306. Light gray to white powder. Almost completely insoluble in water; less than 1% soluble in ethyl ether; slightly soluble in trichlorethylene. Suggested uses: Rubber chemicals, pharmaceutical intermediates, dyestuff intermeds. Availability: Commercially available after February, 1952. Maumee Development Co.

DODECYL BENZENE

M.W. 250 approx. (average); Specific Gravity 20/40°C., 0.87; color, 20 to 50 Pt-Co (Hazen) standards; boiling range, 285 to 310°C.; odor Mild; Flash Point, less than 200°F. A mixture of isomeric dodecyl benzenes, contains small quantities of higher and lower molecular weight homologs; Practically colorless, has a mild odor. High flash point and attached alkyl chain give it solvency characteristics resembling those of a mixture of high boiling paraffinic and aromatic solvents.Suggested uses: Intermediate for the manufacture of alkyl aryl sulfonate type detergents. It may be sulfonated with a wide variety of sulfonating agents under a broad range of conditions to yield sulfonates characterized by excellent detersive, wetting and emulsifying properties, lack of odor, light color, minimum stickiness and fine susceptibility to building. Shell Chemical Corp.

DODECYL PHENOL

M.W., 262; Sp.G., 0.940, 25°C./4°C.; distillation range, 95% between 180-220°C., 10mm. Availability: Pilot-plant quantities.

DYPNONE

$C_6H_5COCH{:}C(CH_3)C_6H_5$. M.W., 222.27; Sp.G., 1.093 @ 20°/20°C.; B.P., 246°C. (50 mm.), decomposes below atmospheric B.P.; V.P., <0.01 mm. Hg @ 20°C.; Fr. P., sets to a glass below —30°C.; Visc., 39.7 cps. @ 20°C.; Fl. P., 350°F. (Cleveland Open Cup); sol. in water, <0.01% by wt. @ 20°C.; sol. water in, 0.34% by wt. @ 20°C.; odor, mild, fruity; color, light yellow. Chemical properties: High absorption of ultraviolet light (coating less than 0.000004 inch thick blocks over half the incident ultraviolet rays in direct sunlight). Can be hydrogenated but the carbonyl group and the unsaturated double bond do not react as would be expected of a conjugate system. The compound appears incapable of Deils-Alder addition; in its reactive properties it resembles mesityl oxide. Uses: In light screening coatings; as a softening agent, plasticizer, perfume base and ink and dye solvent (particularly important for printing vinyl coatings). Availability: Commercial quantities. Carbide and Chemicals Co., Division of Union Carbide and Carbon Corp.

ETHYLBENZENESULFONYL FLUORIDE

A clear to reddish liquid boiling from 230° to 247°C. and having fair heat stability. The side chain of this compound is readily chlorinated when catalyzed by either ultraviolet light or iron chloride. After 20 hours in water at 25°C. less than 0.5% hydrolysis of the fluoride atom is observed. After one hour at 100°C. hydrolysis of the fluoride atom is approximately 2.5%. Availability: In pilot-plant quantities. Pennsylvania Salt Manufacturing Co.

2-ETHYL-2-BUTYL PROPANEDIOL-1,3

$HOCH_2C(C_2H_5)(C_4H_9)CH_2OH$. M.W., 160.25; Sp.G., 0.931 @ 50°/20°C.; B.P., 178°C. (50 mm.); Fr. P., 41.4°C., sol. in water, 0.8% by wt. @ 20°C.; white, crystalline solid. Chemical properties: The two primary hydroxyl groups undergo the characteristic reactions of alcohols. Suggested uses: In insect repellent formulations; preparation of plasticizers, synthetic lubricants, and emulsifying agents. Availability: Commercial quantities. Carbide and Carbon Chemicals Co., Division of Union Carbide and Carbon Corp.

ETHYLENE CARBONATE

OCH_2CH_2OCO. M.W., 88.03; Sp.G., 1.3218 @ 39/4°C.; R.I., 1.4158 @ 50°C.; F.P., 36.4°C.; B.P., 248°C. (sl. decomp.); soluble in water, lower alcohols, and in many esters, chlorinated solvents, aromatic hydrocarbons. Chemical properties: Reacts with numerous amines, phenols, alcohols, and similar compounds containing an active hydrogen to give beta-hydroxyethyl derivatives. At or near room temperatures the reaction with many aliphatic amines yields beta-hydroxyethyl esters of carbamic acids (urethanes). Stable when neutral. Sensitive to acid and quite easily decomposed by alkali. Decomposes under heat to yield ethylene oxide and carbon dioxide. Suggested uses: Intermediate in the synthesis of pharmaceuticals, agricultural chemicals, rubber additives and other organic chemicals. Solvent for certain natural and synthetic poymers. In situ source of ethylene oxide. Availability: Research quantities. Jefferson Chemical Company, Inc. Carbide and Carbon Chemicals Co., Division of Union Carbide and Carbon Corp.

ETHYLENE GLYCOL DIMETHYL ETHER

$CH_3OCH_2CH_2OCH_3$ M.W. 90.078; Sp.G. 0.8674 @ 20°/20°C.; B.P. 85.2°C.; (760 mm.); miscible with both water and hydrocarbons; flash point (Tag, closed cup), below 1.5°C.; Odor, ethereal; color, water white. Chemical properties: There is no active hydrogen atom so, therefore, is recommended as a solvent for Grignard and sodium condensation reactions; an azeotrope is formed with water which boils below the pure material to make it a good antiblushing agent. Suggested uses: In organic synthesis as a solvent, as an antiblushing solvent for various lacquers; solvent for cellulose esters. Availability: Pilot-plant quantities. Ansul Chemical Co.

ETHYLENE GLYCOL MONOSTEARATE 70

Ester of exceptionally high (70%) mono-content; less than 1.5% free glycol. M.P. 50°C; acid number 3.0 max. Pronounced improvement in hydrophilic properties over ordinary commercial grades. Suggested uses: Opacifying, bodying and stabilizing agent for cosmetic formulations. Availability: Commercial quantities. Kessler Chemical Co., Inc.

N-ETHYL ETHANOLAMINE

$C_2H_5NHC_2H_4OH$, M.W., 89.14; Sp.G., 0.9182 @ 20°/20°C.; B.P., 167.1° (760 mm.); V.P., 0.4 mm. Hg @ 20°C.; Fr. P., —7.8°C.; sol. in water, complete @ 20°C.; sol. in water, complete @ 20°C.; Flash P., 160°F. (Cleveland Open Cup). Chemical properties: Undergoes reactions characteristic of secondary amines and primary alcohols. Suggested uses: Preparation of surface-active agents, textile dyestuffs, pharmaceuticals, insecticides, fungicides, and resins. Availability: Research quantities for experimental use. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp

ETHYL MERCURIC PHOSPHATE

White microcrystalline solid with approximate formula: $C_2H_5HgPO_4$. Water insoluble, easily dispersed. Suggested uses: Seed disinfectant; fungicide; medicinals. Availability: Small quantities. Monsanto Chemical Co., Phosphate Division.

2-ETHYL-3-PROPYLACRYLIC ACID

M.W., 142.19; Sp.G., 0.9484 @ 20°/20°C.; B.P., 232.1°C. (760 mm.); V.P., <0.01 mm. Hg @ 20°C.; Fr. P., —7.8°C.; Visc., 14.0 cps @ 20°C.; R.I., 1.4604 @ 20°C.; sol. in water, 0.02% by wt. @ 20°C.; sol water in, 0.42% by wt. @ 20°C. Chemical properties: Undergoes the reactions characteristic of organic acids; the double bond may be used for polymerization in copolymerization with other ethylenic monomers. Uses: Pharmaceutical intermediate, preparation of specialty resins, plasticizers, and lubricants. Availability: Semi-commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

FERRIC TANNATE

Blue-Black crystalline powder. Insoluble in water. Soluble in dilute acids and alkali. Use: medicine. Availability: Laboratory scale. City Chemical Corp.

FLUOROBENZENE

C_6H_5F. M.W. 96.1. Colorless mobile liquid with pleasant aromatic color. M.P.—41.9°C.; surface tension at 20°C. 27.71 dynes/cm.; viscosity at 25.7°C. 0.0056g./cm.sec.; infinitely soluble in alcohol and ether; sparingly soluble (0.154g./100g. at 30°C.) in water. Undergoes typical substitution reactions (halogenation, nitration, sulfonation, etc.) yielding the para-derivatives, together with some ortho-. Chlorination under irridation yields $C_6H_5FCl_2$. Convertible to alkyl or aryl benzenes by treatment with lithium akyls or aryls. Use: In making insecticides, dyestuff intermediates. Available in small quantities for experimental purposes. Pennsylvania Salt Manufacturing Co

FLUOROFORM

CF_3H. M.W., 70; B.P., —82.5°C.; F.P., —160°C.; Crit. Temp., 25°C.; Sp. G. (liq.), 1.42 @ —70°C.; Colorless, odorless gas. Chemical properties: No reactivity at ordinary temperatures. Does not hydrolyze or undergo haloform reactions. Physiologically inert. Use: Low temp. refrigerant. Inert atmosphere. Available in pilot plant quantities. Minnesota Mining & Manufacturing Co.

FURFURIN

A white crystalline product whose structural formula is generally represented: $C_{18}H_{18}O_3N_6$ Furfurin is also known as 2,4,5-trifurylimidazoline. As a base it forms salts with acids; the nitrate exists in two forms. With acetic anhydride or acetyl chloride, furfurin forms a monoacetyl derivative which is unaffected by methyl iodide. Available in small quantities for experimental investigation. Quaker Oats Co., Chemicals Dept.

FURFURYLAMINE

$(CH_2OC{\cdot}CH_2NH_2$ M.W. 97.11; Sp. G. 1.0502 @ 25°/25°C; R.I., 1.4874 @ 25°C; B.P., 144°C (760 mm); miscible with water, soluble in alcohol and ether; color, Gardner (1933) scale, 9. Chemical properties: the amino group is comparable in basicity to methylamine. The double bonds are similar in activity to those of furfural. Opening of the ring can be accomplished only with difficulty. Uses: As vapor phase corrosion inhibitor for boiler and steam lines and in the synthesis of pharmaceuticals, dyes, and rubber chemicals. Available on pilot plant scale. Commercial Solvents Corp.

HEXANETRIOL-1, 2, 6

$HOCH_2CH(OH)CH_2CH_2CH_2OH$. M.W., 134.17; Sp. G., 1.1063 @ 20°/20°C.; B.P., 178°C. (5 mm.); V.P., <0.01 mm. Hg @ 20°C.; Fr.P., sets to a glass below —20°C.;

Visc., 2584 cps. @ 20°C.; R.I., 1.4771 @ 20°C.; Fl. P., 380°F. (Cleveland Open Cup); miscible with water in all proportions @ 20°C.; color, water-white. Chemical properties: similar to those of glycerol; contains three hydroxyl groups which undergo characteristic reactions with acids, chlorinating agents, etc. Uses: softener and plasticizer for casein, zein, starch, dextrin, animal glue, cellophane, cork, and tobacco; intermediate for the preparation of alkyd and other synthetic resins, high boiling plasticizers for nitrocellulose and vinyl resins; coupling agent and solvent for special hydraulic fluids, metal cleaners, duplicating fluids, textile dyes, and adhesives. Available in semi-commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

o-HYDROXY-ACETOPHENONE

$C_6H_4(OH)COCH_3$. M.W., 136.14; Purity, 98.0%; Sp. G., 1.1307 @ 20.8°C; B.P., 213°C @ 717 mm; R.I., 1.5580 @ 20° C/D; Sol., sl. sol. H_2O; odor, minty; color, highly refractive greenish-yellow; form, liquid; Chemical properties: undergoes condensation reaction; Uses: In the synthesis of a number of coumarin derivatives, and generally in the synthesis of dyes, pharmaceuticals, rodenticides and other organic chemicals. Available in commercial quantities, American-British Chemical Supplies, Inc., Kay-Fries Chemicals, Inc.

1-HYDROXYADIPALDEHYDE

$OHCCH_2CH_2CH_2CH(OH)CHO$. Representative properties of 50% aqueous solution: Sp. G., 1.149 @ 20°/20°C.; B.P., 101.5°C. (760 mm.); V.P., 15 mm. Hg @ 20°C.; Fr. P., —6.2°C.; Visc., 29.3 cps. @ 20°C.; R.I., 1.4181 @ 20°C.; pH, 2.25 (approx.); completely miscible with water; Fl. P., none; order, sharp; color, water-white. Chemical properties. Reacts with proteins and polyhydroxy compounds resulting in insolubilization; forms acetals with alcohols; reacts with primary amines to form imides, and with sodium bisulfite to form the sodium bisulfite addition product. Uses: Insolubilization of proteins and polyhydroxy compounds to give products useful as binders for bonding of cork, gaskets, and matches; sizes for paper; coatings for washable wall paper. Suggested for trial for imparting shrink-proofness and crease-resistance to textiles such as rayon, cotton, and wool. Available in semi-commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

m-HYDROXYBENZOIC ACID

$C_6H_4(OH)COOH$. M.W., 138.12; Appearance, white crystalline powder; M.P., 202°C.; v. sl. soluble in cold water; sl. soluble in ether; soluble in hot water and hot alcohol. Chemical properties: As a result of the hydroxyl and carboxyl groups, meta hydroxybenzoic acid lends itself to a number of chemical reactions including esterification; ring substitution is also possible with this material. Uses: In the synthesis of pharmaceuticals, insecticides, dyes and other organic chemicals. Available in pilot-plant quantities. Heyden Chemical Corp.

2-HYDROXY-1, 4-NAPHTHOQUINONE

$C_{10}H_5O_2OH$. Molecular weight: 174.15, Yellow solid. Sublimes. Soluble in various solvents and aqueous alkalies. Reacts with carbonates. Use: in cosmetics and pharmaceuticals. Available in experimental quantities. National Aniline Division, Allied Chemical & Dye Corp.

3, 3'-IMINOBISPROPYLAMINE

$(NH(CH_2CH_2CH_2NH_2)_2)$. M.W. 131.23; colorless liquid; B.P., 151°C. at 50 mm.; F. P., —14.5°C.; density, 0.9237 g./cc. at 25°C.; R.I., @ 25C 1.4798; dissociation constants, 6.3 x 10^{-4}, 5.0 x 10^{-8}, 5.0 x 10^{-7}; miscible with most common solvents such as water, alcohols, ether, benzene, chloroform, ketones, and ethyl acetate, sl. sol. in heptane. Chemical properties: Undergoes typical amine reactions. The presence of three strongly basic groups aids in the completion of reactions with all three groups. Uses: Intermediate for the preparation of ion exchange resins, surface active agents, rubber chemicals, pharmaceuticals, and dyestuffs. Available in trial lot quantities for experimental investigation. American Cyanamid Co.

ISOPROPYLAMINOETHANOLS (IPAE)

Carefully balanced blend of isopropylmonoethanolamine and isopropyldiethanolamine. Combining weight, 116; Sp. gr. @ 20°/20°C., 0.93; Content as IPAE, 97%; Color, straw; Odor, mild amine; Refractive Index @ 20°C., 1.4478; Viscosity @ 20°C., 50.8 centipoises; Flash Point (open cup) 145°F.; Soluble in Water, ethanol, acetone, hexane, and benzene. Uses: Intermediate for emulsifiers, particularly for wax emulsions. Available in semi-commercial quantities. Sharples Chemicals Inc.

KAOLIN, COLLOIDAL KAOLINITIC,

Chemical Analysis: SiO_2, 44.69%; Al_2O_3, 39.67%; TiO_2, 1.65%; Fe_2O_3, 0.57%; CaO, 0.00%; MgO, 0.00%; Na_2O, K_2O, 0.00%. Mechanical analysis: 0-0.5 Micron, 43.6%; 0.5-1 Micron, 12.2%; 1-2 Micron, 12.6%; 2-5 Micron, 14.2%; 5-10 Micron, 6.9%. P.C.E., Cone 34-35. A pure high grade colloidal kaolinitic kaolin. Suggested uses: Extenders, fillers, coating agents, various high temperature refractories. Commercially available. The Thomas Alabama Kaolin Co.

LANOLIN ALCOHOLS

These alcohols comprise the total unsaponifiable portion of Lanolin. This product represents a light yellow wax, having a melting point of 66°C. Three distinctively different groups of organic alcohols are present in this material; they are the sterols, with cholesterol being its main representative; the triterpene alcohols with lanosterol as its main representative; and finally the aliphatic alcohols; they consist of straight-chain alcohols with carbon atoms from C9 to C26. The sterols represent about 30%, the triterpene alcohols about 20% and the aliphatic alcohols about 50% of the total. Use: In cosmetics. Their ability to absorb five times their weight of water makes them especially suitable for the preparation of creams and lotions. Their high melting point would suggest the use as starting material for lipsticks. Botany Mills, Inc.

LANOLIN ALIPHATIC ALCOHOLS

These alcohols represent the remaining part of the Lanolin Alcohols after the removal of most of the sterols and triterpene alcohols. They are a semi-solid material of a dark amber color having a melting point of about 42°C. Some of the alcohols present are: Cetyl Alcohol $C_{16}H_{33}OH$, Ceryl Alcohol $C_{27}H_{55}OH$, and Carbaunyl Alcohol $C_{24}H_{490}H$. Lanolin Aliphatic Alcohol yields readily to sulphation. Use: As starting material for detergents. However, their outstanding feature is their stabilizing effect on emulsions especially in conjunction with soaps produced from lanolin fatty acids. Botany Mills, Inc.

LANOLIN FATTY ACIDS

These fatty acids are the saponifiable portion of Lanolin, consisting of the fatty acids which form the lanolin esters. They resemble an opaque solid, light tan somewhat greasey feeling material, stable in storage. The lanolin acids are not identical with the normal acids of oils and fats, but belong to other unique series and their properties are quite distinct from those of fatty acids from other sources. A. W. Weitkamp identified 32 fatty acids, comprising 9 members of normal fatty acid series, 2 optically active, 2 hydroxy acids, 10 iso-acids and 11 dextrotatory antiso acid. No unsaturated acids were isolated. The number of carbon atoms are from C_9—C_{31}. Lanolin fatty acids are readily saponifiable. Use: the manufacture of metallic soaps for various purposes, such as greases for high pressure lubrication, and as additives to obtain desired properties in paints, and varnishes. Lanolin fatty acid soaps are also good emulsifiers and are recommended for uses in this field. Botany Mills, Inc.

LANOSTEROL

Botany Lanosterol is that fraction of the Lanolin Alcohols which represents the tri-terpene alcohols. It has the same molecular weight and empirical formula as the resin alcohols amyrenol and lypeol, to which it is closely related. Lanosterol has two double linkages in the picene uncleus, which is common to tri-terpene alcohols. Its chemical formula is $C_{30}H_{50}O$; its molecular weight is 426; its melting point is 140-142°C; its iodine value is 70. The structural formula of Lanosterol is not yet definitely established. It is produced as a white crystalline powder; when heated above its melting point it solidifies upon cooling to a very hard shiny material resembling a wax. Use: In wax formulation, where it has the ability to up grade poorer waxes by imparting higher melting points, hardness and gloss. There is also a possibility of applying its unique qualities in the insulating field. Botany Mills, Inc.

LAUROYL PEROXIDE

$[CH_3(CH_2)_{10}COO]_2$. M.W. 398.6; melting point, 48-50°C. (dec.); Insoluble in water; very soluble in benzene. Container, 100-lb. cartons. Suggested Uses: Polymerization catalyst, bleaching agent, source of free radicals for general catalysis. Available in commercial quantities. Monsanto Chemical Co., Phosphate Division.

LAURYL 24

Clear, colorless, technically pure lauryl alcohol; practically nil iodine, acid, and saponification values; 95-98% C_{12} alcohol. Starting point for manufacture of high-foaming detergents that remain clear at low temperatures and plasticizer specialties. Laboratory sample quantities available for testing. M. Michel and Company, Inc.

L-LEUCINE

A highly refined natural leucine isolated from vegetable protein. Use: formulation of pharmaceutical products and for organic synthesis. Available in semi-commercial quantities. A. E. Staley Manufacturing Co.

LITHIUM DICHROMATE

$Li_2Cr_2O_7.2H_2O$. M.W. 265.93; D, 2.34; solubility in water, 65.1% at 30°C.; appreciably soluble in lower alcohols. Bright red-orange crystals, deliquescent. Chemical properties similar to other dichromates. Suggested uses: similar to other dichromates, in systems where sodium, potassium, or ammonium salts may not be used; corrosion inhibitor in lithium chloride brines used for dehumidification in airconditioning; to prepare alcohol solutions containing hexavalent chromium. Available in pilot plant quantities. Mutual Chemical Co. of America

LITHIUM TANNATE

Tan powder, darkens on contact with water Contains approximately 2% Lithium. Available in pilot plant quantity City Chemical Corp.

MAGNESIUM DICHROMATE

$MgCr_2O_7.5H_2O$. M.W., 330.42; D, 1.96; solubility in water, 81.0% at 25°C. Bright red-orange crystals, very deliquescent. Transition to $MgCr_2O_7.H_2O$ at 89.4°C. Chemical properties similar to sodium dichromate. Suggested uses: similar to other dichromates, in systems where sodium, potassium or ammonium salts may not be used, or where an unusually soluble and deliquescent salt is required, for example in a non-corrosive brine, anti-freeze solution, or heat-exchange or dehumidifying medium. Available in pilot plant quantities. Mutual Chemical Co. of America

MAGNESIUM RICINOLEATE

Coarse, yellow granules. Odorless, or having only a slight odor of fatty acid. M.W. 614; M.P. 98°C; Bulk Density .43 gr/cc; Sp. Gr. 1.03 @ (25°/25°C). Suggested uses: thickening agent; flatting agent; cosmetics. Available in commercial quantities. The Baker Castor Oil Company.

3-METHOXYBUTYL ACETATE

$CH_3OC_4H_8OCOCH_3$. M. W., 146.18; Sp. G., 0.9561 @ 20/20°C.; B.P., 171.2°C. (760 mm.), 91°C. (50 mm.), 59°C. (10 mm.); V.P., 1 mm Hg @ 20°C.; Fr. P., —95°C.; Visc., 1.3 cps. @ 20°C.; R.I., 1.4086 @ 20°C.; sol. in water, 6.2% by wt. @ 20°C.; sol. water in, 4.1% by wt. @ 20°C.; colorless liquid. Its evaporation rate is slightly lower than that of "Cellosolve" acetate and therefore it may be used as a solvent for brushing lacquers and to improve flow-out and blush resistance in nitrocellulose lacquers. Uses: solvent for lacquers and printing inks. Available in research quantities. Carbide and Chemicals Co., a Division of Union Carbide and Carbon Corporation.

3-METHOXYBUTYRIC ACID

$CH_3OC_3H_6COOH$. M.W., 118.13; Sp. G., 1.053 @ 20/20°C.; B.P., 140°C. (50 mm.), 105°C. (10 mm.); V.P., 0.05 mm. Hg. @ 20°C.; Fr. P., 12°C.; Visc., 13.7 cps. @ 20°C.; R.I., 1.4210 @ 20°C.; sol. in water, complete; colorless liquid. Chemical properties: undergoes reactions characteristic of organic acids. Uses: intermediate for preparation of synthetic flavors, plasticizers, varnish dryers, and pharmaceuticals. Available in research quantities for experimental use. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

METHYL CHLORMETHOXY STEARATE

Mixture of methyl chlormethoxy stearate and methyl dichlorostearate. Average M.W. 364; Sp. G. 0.980 at 20°/4°C; R.I. 1.460 at 20°C; flash point (tag open cup) 130°C; insoluble in water, soluble in acetone, xylene, V. M. and P naphtha, carbon tetrachloride, methanol, butanol, ethyl acetate and carbitol; Fr. p. 8.0°C; acid value less than 3.0; iodine value less than 4.0; saponification value 212.0; % chlorine 13.8. Chemical properties: The chlorine is relatively inert but can be reacted with various salts under drastic conditions; soaps, metallic soaps, amides and other esters can be prepared from it. Suggested uses: lubricating oil additive; plasticizers; rubber chemical. Available in pilot plant quantities. Nopco Chemical Co.

4-METHYL-7-DIETHYLAMINO COUMARIN

$(C_2H_5)_2NC_6H_3OCOCH{:}CCH_3$. M.W., 231.28; m.p. 68-72°C; Color and form, light tan to white crystals; odorless; sol. in water, 0.006% @ 25°C. Dissolves readily in aqueous solutions of strong mineral acids, forming the amine salt. Very soluble in most organic solvents; such as alcohols, ketones, esters, ethers, glycols, chlorinated hydrocarbons; very slightly soluble in aliphatic hydrocarbons. Very dilute solutions in organic solvents exhibit a strong bluish-white fluorescence under ultra-violet light or sunlight. Substantive to wool and protein fibers. Suggested uses: As optical bleach or whitening agent for soaps, laundry products, plastics, waxes and fabrics; ultra-violet screen in plastics, waxes, sun-tan lotions and paper. Available in pilot plant quantities. Carlisle Chemical Works, Inc.

METHYL HYDROXY STEARATE
(Paricin* 54)

$(C_{19}H_{38}O_3)$ Avg. M.W. 312; White, waxy solid in the form of short flat rods; M.P. 48°C; Acid Value 4; Sap. Value 177; Iodine Value 3; Insoluble in water; limited solubility (2-50%) in organic solvents; compatible with nitrocellulose; cellulose acetate butyrate; ethyl cellulose; vegetable waxes; paraffine; rosin. Suggested uses: adhesives; anti-blocking agent; binder; inks; cosmetics; lubricant; greases; hot melts; wax compositions; polishes; waterproofing; wire drawing. Available in commercial quantities. The Baker Castor Oil Company.

METHYL ISOPROPENYL KETONE

M.W., 84.11; Sp. G., 0.852 @ 20/20°C.; B.P., 97.9°C. (760 mm.), 29°C. (50 mm.), -1°C. (10 mm.); R.I., 1.4219 @ 20°C.; V.P., 34 mm. Hg @ 20°C.; Fr. P., 58.0°C.; Visc., 0.5 cps. @ 20°C.; Heat of Vaporization, 174 B.t.u./lb. @ 1 atm.; sol. in water, 0.9% by wt. @ 20°C.; sol. of water in, 3.0% by wt. @ 20°C. Chemical properties: polymerizes alone and copolymerizes with other ethylenic monomers; possesses an active ketone group. Uses: preparation of polymers for resinous plasticizers, molding plastics, and synthetic rubbers by copolymerization with butadine, ethylene oxide, vinyl acetate, ethylene, substituted butadienes, and methacrylates; component of fumigant formulation; reacts with alkali cellulose to give products useful as textile sizes. Available in semi-commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

6-METHYL URACIL

M.W. 126.11; True Density, 1.491 g./ml. @ 20°C.; melts with decomposition at 317-319°C.; colorless crystalline material practically insoluble in water and most organic solvents. Chemical properties: forms methyl dichloropyrimidine with phosphorus oxychloride; is nitrated with nitric acid to nitromethyl uracil which can be reduced to amino methyl uracil; can be methylated to di- or trimethyl uracil with potassium hydroxide and methyl iodide; condenses with formaldehyde under alkaline conditions to form a series of methylol methyl uracils. Uses: pharmaceutical intermediate. Available in research quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

MYRCENE-85

$C_{10}H_{16}$; M.W. 136; Sp. G. @ 15.5°C. 0.809; pale yellow to yellow red color; 80-85% purity; B.P. Polymerizes on heating; characteristic mild olefinic odor. Chemical Properties: Contains a highly reactive conjugated double bond with triple unsaturation. Polymerizes and copolymerizes with many monomers to yield widely diverse elsatomers, resins and plastics. Will condense with phenols. Uses: Starting product for preparing linolool, citral and other essential oil bases and odors, rubber-like products, emulsifying and wetting properties, resins for protective coatings, plastics, insecticides, plasticizers and paint driers. Available in commercial quantities. The Glidden Co.

NAPTHALENESULFONYL FLUORIDE

A white solid melting from 43° to 51°C. Possesses fair heat stability. Compound may be readily chlorinated on the ring adjacent to the sulfonyl group when catalyzed either by ultra-violet light or iron chloride. Possible interest in organic synthesis. Available in pilot plant quantities. Pennsylvania Salt Manufacturing Co.

ORTHO NITRO BENZOIC ACID

Molecular weight, 167.0. Yellow crystalline solid. Soluble in organic polar solvents. Suggested use: Intermediate for pharmaceuticals. Available in limited commercial quantities. National Aniline Division, Allied Chemical & Dye Corp.

NOPOL

C_9H_{15}. CH_2OH; M.W. 166; Sp. G. 0.973 @ 15.5°C; R.I. 1.4984 @ 25°C; Optical Rotation—36.6° (10 cm. tube); 98% purity; B.P. Isomerizes in range of 230-240°C; pleasant pinene odor; color, waterwhite to light straw; soluble in all common organic solvents in all proportions and is an excellent non-volatile solvent for many resins and dyes. Chemical Properties: The highly reactive primary alcohol group and the pinene group are combined in one molecule. Well-known reactions such as esterification with anhydrides to make resins, hydrogenation, halogen acid derivatives. Suggested Uses: Synthesis of essential oils, film-forming drying resins and a number of optically pure terpene chemicals. Available in pilot plant quantities. The Glidden Co.

TERTIARY-OCTYLAMINE

$t\text{-}C_8H_{17}NH_2$. M.W., 129. Sp. G., 0.7726, 25°C./4°C. R.I., 1.4213, 25°C. B.P., 137-142°C., 760 mm. Flash point, 92°F., tag open cup. Chemical properties: undergoes characteristic reactions of primary aliphatic amines. Suggested uses: corrosion inhibitors, oil additives, surface active agents, bactericides, fungicides, textile finishing agents, ore flotation. Available in commercial quantities. Rohm and Haas Co.

PERFLUOROBUTANE

C_4F_{10}. M.W., 238; B.P., —2.5°C.; F.P., —80°C.; Crit. Temp., 113°C.; Sp. G., 1.6 @ B.P., Heat of vap., 5,580 cal./mol. @ B.P., Colorless, odorless gas. Chemical properties: Inert chemically and physiologically. Use: Refrigerant. Inert, heavy atmosphere. Gaseous dielectric. Availability: Pilot plant quantities. Minnesota Mining & Manufacturing Co.

PERFLUOROBUTYRIC ACID

$C_3F_7CO_2H$. M.W., 214; Sp. G., 1.641 @ 25°/4°C.; R.I., 1.290 @ 25°C.; B.P., 120.0°C @ 755 mm.; F.P., —17.5°C.; Surf. ten., 15.8 dynes/cm. @ 30°C; colorless liquid; sharp odor, similar to butyric acid. A strong acid; almost completely ionized in water. Miscible with water, acetone, ether, methanol, and pet. ether. Soluble in benzene and carbon tetrachloride. Chemical properties: Undergoes most of the usual reactions of carboxylic acids. Alcohols, amines, aldehydes, ketones, amides and nitriles can be prepared. Suggested uses: As a chemical intermediate it provides a means of introducing C_3F_7CO-, $C_3F_7CH_2$-, and $C_3F_7CH{=}$ groups into organic molecules. Polymers containing C_3F_7 groups have unusually low refractive index, good solvent resistance and excellent weatherability. Available in pilot-plant quantities. Minnesota Mining & Manufacturing Co.

PERFLUOROETHANE

C_2F_6. M.W., 138; B.P., —78°C.; F.P., —101°C.; Crit. Temp. 24°C.; Sp. G., 1.6 @ —78°C., Heat of vap., 3,860 cal./mol. @ B.P.; Colorless, odorless gas. Chemical properties: Inert chemically and physiologically. Use: Low temperature refrigerant. Inert, heavy atmosphere. Gaseous dielectric. Available in pilot plant quantities. Minnesota Mining & Manufacturing Co.

PERFLUOROPROPANE

C_3F_8. M.W., 188; B.P., —37°C.; F.P., —160°C.; Crit. Temp. 70°C.; Sp. G., 1.586 @ —37°C.; Heat of vap., 4,500 cal./mol. @ B.P.; Colorless, oderless gas. Chemical properties: Inert chemically and physiologically. Uses: Refrigerant. Inert, heavy atmosphere. Gaseous dielectric. Available in Pilot plant quantities. Minnesota Mining & Manufacturing Co.

PERFLUOROPROPIONIC ACID

$C_2F_5CO_2H$. M.W., 164; Sp. G., 1.561 @ 20°C.; R.I. 1.2838 @ 25°C.; B.P., 96°C. @ 740 mm. Colorless liquid; strong, pungent odor. A strong acid, almost completely ionized in water. Forms monohydrate which boils at 107.5°C. Chemical properties: Reactions and solubility characteristics are similar to perfluorobutyric acid. Suggested uses: As a chemical intermediate it provides a means of introducing C_2F_5CO-, $C_2F_5CH_2$-, and $C_2F_5CH{=}$, groups into organic molecules. Polymers with unusual properties can be prepared. Available in pilot plant quantities. Minnesota Mining & Manufacturing Co.

PERFLUOROTRIBUTYLAMINE

$(C_4F_9)_3N$. M.W. 671; Sp. G., 1.882 @ 20°C.; R.I., 1.2903 @ 25°C.; B.P., 178°C.; F.P., —32°C.; Viscosity, 3.3 centistokes @ 20°C.; Colorless, odorless liquid. Chemical properties: Chemically stable. Does not undergo the typical reactions of organic amines. Non-basic. Physiologically inert. Use: Heavy inert fluid. Manometer and flotation liquid. Heat transfer medium. Reaction medium. Available in pilot plant quantities. Minnesota Mining & Manufacturing Co.

PERFLUOROTRIETHYLAMINE

$(C_2F_5)_3N$. M. W., 371; Sp. G., 1.749 @ 20°C.; R. I., 1.2615 @ 25°C.; B. P., 69°C.; F. P., —110°C.; Viscosity, 0.54 centistokes @ 20°C.; Colorless, odorless liquid. Chemical properties: Chemically stable. Does not undergo the typical reactions of organic amines. Non-basic. Physiologically inert. Applications: Heavy inert fluid. Flotation liquid. Inert atmosphere. Heat transfer medium. Reaction medium. Available in pilot plant quantities. Minnesota Mining & Manufacturing Co.

PHTHALIMIDE

$C_6H_4(CO)_2NH$, Molecular Weight—147.05; Description: White, granular, porous powder. New Feature: New method produces porous particles which make it readily soluble. Will replace sublimed material at substantial savings to the consumer. Solubility: Practically insoluble in water and benzene, 4 grams dissolve in 100 cc. of alcohol. Readily dissolved in NaOH to form the Sodium Salt. Specifications: Purity 98% min. Melting Point 233-235°C. Moisture 1% max. Phthalic anhydride 2% max. Iron slight trace. Use: Dyestuff intermediate, drug intermediate, Gabriel synthesis. Available in commercial quantities. Maumee Development Co.

PLUROXIN E231

$HOOC(C_2H_4O)_xCOOH$, x=3.2 (average). A polyoxyalkylene dicarboxylic acid. Average molecular weight=231. Viscous straw-colored liquid. Faint odor. Over 90% free dicarboxylic acid. Freezing point —16° to —20°C., density 1.3 at 25°/4°C. Refractive Index $n_D = 1.468$, pH of 5% solution 2.8. Soluble in water; insoluble in CCl_4 or Benzene. Suggested uses: The presence of two reactive acid groups suggests use in synthetic resins and plasticizers, particularly where water solubility is desired. Imparts hydrophilic properties to derivatives. Esters may be used as solvents and modifiers. Available in limited research quantities. Wyandotte Chemicals Corp.

POLYETHYLENE GLYCOL CHLORIDE 210

$H(OCH_2CH_2)_nCl$. Sp. G., 1.1655 @ 20/20°C.; Fr. P., sets to a glass at —60°C.; Fl. P., 280°F. (Cleveland Open Cup); Fire P., 490°F.; odor, @ 20°C. Chemical properties: May be condensed with alkali celluloses; terminal chlorine atom reacts with amines or amides to form the corresponding polyglycolamine or amide, it may also react with alkali cyanides to form, after acid hydrolysis, the corresponding carboxylic compound. Uses: Preparation of non-ionic surface-active agents, dyeing assistants, water-soluble dyestuffs, and textile and leather specialties. Available in semi-commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

POLYPROPYLENE GLYCOL 2725

$HO(C_3H_6O)_nC_3H_6OH$. Avg. M.W., 2725; Sp. G., 1.0 (approx.) @ 20°/20°C.; Visc. range 1600-1700 S.U.S. @ 100°F.; Fl. P., 420°F. (Cleveland Open Cup); Fire P., 490° F.; odor, mild; color, light yellow; soluble in aliphatic ketones, alcohols, and esters, glycol-esthers, and in most common chlorinated solvents as well as in large numbers of aliphatic and aromatic hydrocarbons; only very slightly soluble in water; compatible with natural waxes, oils and resins such as carnauba wax, beeswax, pine oil, ester gum, and wood rosin. Chemical properties: The two hydroxyl groups can be esterified

with organic and inorganic acids; with dibasic acids it forms resins of the alkyd type. Uses: Preparation of emulsifying and de-emulsifying agents, resins, plasticizers, defoaming agents, hydraulic fluids, metal lubricants, and textile compounds. Available in semi-commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

POLYETHYLENEGLYCOL 400 MONOSTEARATE USP XIV

A non-ionic dispersant and emulsifier for preparation of Calamine Lotion USP and Phenolated Calamine Lotion NF. Also suitable for manufacture of cosmetic lotions, soft cream bases. Available in commercial quantities. Alrose Chemical Co.

POTASSIUM TRIPOLYPHOSPHATE

Formula: $K_5P_3O_{10}$. Molecular weight 448. Melting point, 620-640°C. Density, 2.54. A white crystalline solid. Solubility in water, over 140 grams in 100 ml at 26°C. pH of a 1% solution, 9.4-9.7. Suggested uses: For applications in formulations containing restricted amounts of water or those requiring a high concentration of polyphosphate for detergent building, dispersing, and sequestering action. Available in commercial quantities. Victor Chemical Works.

PROPYLENE GLYCOL MONOSTEARATE 70

An edible emulsifier and stabilizer for baked goods, margarine & chocolate. 70% mono ester. Offers pronounced hydrophilic properties without the use of soap and other additives. Uses: As an opacifying, bodying and stabilizing agent for cosmetic creams and lotions. White to cream wax. M.P. 35°C. Acid number 3.0 max. Iodine number 3.0 max. Commercially available. Kessler Chemical Co., Inc.

PROPYLENE GLYCOL RICINOLEATE LS

Amber colored, oily liquid. Insoluble in water. Compatible with candelilla, ozokerite, castor oil and lanolin. Solvent and carrier for bromoacids. Commercially available. Kessler Chemical Co., Inc.

2-(4-PYRIDYL) ETHANE SULFONIC ACID

$C_7H_9NO_3S$ M.W., 187.2; M.P., 284°C. dec.; pH of 0.10 N solution in water at 20°C., 3.6; sol. in 100 g. of water at 20°C., 67 g.; purity, 97%. Available in research quantities; commercial quantities will be made available upon demand. Reilly Tar & Chemical Corp.

PYRROLE

$CH{:}CHCH{:}CH.NH$. M.W., 67.09; colorless liquid, darkens on standing; Sp.G., 0.968 @ 20°/4°C.; R.I., 1.509 @ 20°C.; B.P., 130-131°C. (760 mm.); M.P., —24°C.; flash pt. (Tag closed cup), 102°F.; sol. in water, 8.0% by weight; miscible with common organic solvents. Chemical properties: Reacts by substitution, condensation, and splitting of the ring. Suggested uses: Specialized solvent; chemical intermediate. Available in semi-commercial quantities. E. I du Pont de Nemours & Co.

PYRROLIDINE

$CH_2CH_2CH_2CH_2NH$. M.W., 71.12; colorless liquid; penetrating, amine-like odor; Sp.G., 0.8618 @ 20°C.; R.I., 1.4430 @ 20°C.; B.P., 86-87°C. (760 mm.); Vap. P., 205 mm. @ 50°C.; freezing pt., —63°C.; flash pt., (Tag closed cup), 37°F.; miscible with water and common organic solvents. Chemical properties: Cyclic secondary amine; moderately strong organic base; reacts by addition, condensation, acylation, and alkylation; forms a variety of N-substituted pyrrolidines. Suggested uses: Chemical intermediate in the preparation of insecticides, rubber accelerators, and veterinary bases of possible use as sterilizers and surfactants; introduction of the pyrrolidyl ring, a physiologically active nucleus found in many natural products such as alkaloids; solubilizer for acidic materials; catalyst and reaction medium for certin organic reactions. Available in semi-commercial quantities. E I du Pont de Nemours & Co.

RESINOUS ALCOHOL-8

A virtually neutral ester of glycerin, containing esterified rosin and fatty acids and having 4%-5% of free hydroxyl groups. Average molecular weight, 500. Compatible with nitrocellulose. Acid number, 0.5 or lower. Color, (Gardner) 9-10. Viscous non-crystallizing liquid. Insoluble in water, partly soluble in methanol, glycerine. Completely soluble in anhydrous ethanol, xylene, mineral spirits. Compatible with liquid fatty acids at room temperature, in all proportions. Uses: Lacquer plasticizer, adhesives, heat sealing agents, textile coatings, paper coatings, castor oil extender and replacement. Available in semi-commercial quantities. General Mills, Inc.

SALICYLAMIDE

$HOC_6H_4CONH_2$. M.W. 137.1. m.p. 139.0°C. White to cream colored powder. Sl. sol. water; moderately soluble glycerine, propylene glycol; sol. alcohol. Stable in the presence of water, acids, alkalies. Suggested for consideration of its analgesic properties. Available in commercial quantities. Monsanto Chemical Co.

SALICYLAMIDE ACETYL SALICYLIC ACID COMPLEX

$C_6H_4(OH)CONH_2 \cdot C_6H_4(OCOCH_3)COOH$. M.W. 317. Appearance, white crystals; M.P. 101°-102°C.; slightly soluble in water (0.39 g. /100 g. water at 25°C.). Suggested uses: As a pharmaceutical because of its analgesic, antipyretic, antirheumatic, antispasmodic, and sedative properties; as an ingredient in other pharmaceutical formulations. Available in experimental quantities. Heyden Chemical Corp.

SALICYLAMIDE SALICYLIC ACID COMPLEX

$C_6H_3(OH)CONH_2 \cdot C_6H_4(OH)COOH$ M.W. 275.25; Appearance, white crystals; M.P. 118°-119°C.; slightly soluble in water (0.70 g./100 g. water at 25°C.), but somewhat more soluble than either salicylamide (0.24 g./100 g. water at 25°C.), or salicylic acid (0.20 g./100 g. water at 25°C.). Suggested uses: for exploratory evaluation in pharmaceutical products. Available in experimental quantities. Heyden Chemical Corp.

SILVER TRIMETAPHOSPHATE

$Ag_3P_3O_9$. M.W. 484.6. Average analysis: Ag_2O, 56.3-56.7%; P_2O_5, 38.8-39.3%; Ignition Loss at 800°C. 3.4-3.6%. White solid (small crystalls); Insoluble in water. Suggested uses: Preparation of special optical glasses; medicinals. Available in pilot plant quantities. Monsanto Chemical Co., Phosphate Division.

SODIUM BARITURATE

$Na_2C_4H_2O_3$. 2 H_2O. M. W. 208.04. White powder, soluble in water. Available in pilot plant quantities. City Chemical Corp.

SODIUM DICYANAMIDE

$(NaN(CN)_2)$. M.W., 89.04; colorless crystals, decomposing above 315°C.; density, 1.701 g./cc. at 30°C.; soluble in water, insoluble in most organic solvents. The free acid is a highly reactive but unstable organic acid comparable in strength to the hydrogen halides. Chemical properties: Readily reacts with water, alcohols, amines, and other compounds containing active hydrogen. Suggested uses: As an intermediate in the preparation of insecticides, pharmaceuticals, dyestuffs, rubber, textile, and petroleum chemicals. Available in trial lot quantities for experimental investigation. American Cyanamid Co.

SODIUM DIISOPROPYLDITHIOPHOSPHATE

$[(CH_3)_2CHO]_2PSSNa$ M.W., 236.28; colorless crystalline solid; soluble in water, alcohol, and acetone; insoluble in most other organic solvents. Chemical properties: The free acid is a strong reactive organic acid. Undergoes reaction with aldehydes, amines, and a variety of other types of compounds. Suggested uses: As an intermediate for petroleum additives, photographic chemicals, insecticides, herbicides, and vulcanization accelerators. Available in trial lot quantities for experimental investigation. American Cyanamid Co.

SODIUM GLUCONATE

$NaC_6H_{11}O_7$. M.W. 218.13. Free flowing, crystalline powder possessing a characteristic pleasant odor. 60 Grams dissolve in 100 cc of water. Insoluble in most organic solvents. Grades: Technical (tan-colored) and Technical Refined (white). Uses: Sequestering agent, water treatment chemical, leather processing reagent, photographic reagent, cleaning compound ingredient, water paint ingredient, and pharmaceutical chemical. Chas. Pfizer & Co.

SODIUM PARACHLOROBENZENESULFONATE MONOHYDRATE

$p\text{-}ClC_6H_4SO_3Na.H_2O$ M.W., 232.6 pH of 1% Aq. Soln. 9.6. A free flowing coasely crystalline, white powder. It is water soluble, resistant to attack by acids and alkalies, and thermally stable up to 300°C. Use: Hydrotropic agent for organic compounds, such as aniline, benzaldehyde, and cresol. Availbale in pilot plant quantities. Pennsylvania Salt Manufacturing Co.

SODIUM SULFAMATE

$NaNH_2SO_3$ M.wt. 119.1. White crystalline powder. Decomposed at 160-170°C. Available in pilot plant quantities. City Chemical Corp.

SODIUM SULFONATE, OIL SOLUBLE

A high molecular weight alkyl aryl sodium sulfonate, available as a 50% solution in a 160-207°C. boiling range kerosene Sp. G. @ 25°C., 0.88; dark brown color. Soluble in aliphatic and aromatic solvents. Suggested use: As an emulsifying agent where oil solubility is needed and color is not a factor. Available in semi-commercial quantities. Monsanto Chemical Co.

SODIUM SULFONATE PASTE

A high molecular weight alkyl aryl sodium sulfonate and is available as a 70% active content paste in water. Sp. G. .105; dark brown, very viscous paste. Suggested use: As a low cost surface active agent where color is not a factor. Available in semi-commercial quantities. Monsanto Chemical Co.

SODIUM SULFONATE, WATER SOLUBLE

A high molecular weight alkyl aryl sodium sulfonate as a 25% solution in water. Sp. G. @ 25°C., 1.01; dark brown color. Suggested use: As a low cost surface active agent where color is not a factor. Available in semi-commercial quantities. Monsanto Chemical Co.

SODIUM SULFONATES, REFINED (60%)

Specifications: Molecular weight, 450 Min.; Inorganic Salts (as sodium sulfate), 0.7 %w. Max.; Sulfonate Content 60%w. Min. Sodium sulfonates, refined (60%) are a mixture of high molecular weight sulfonates in a hydrocarbon solution. Use: As a basis for producing lubricating oil additives, particularly for premium type oils, wherein they function as surface active agents, preventing deposition of products of oxidation and fuel decomposition. Sodium sulfonates are also useful in formulating insecticides and textile and cutting oils. Sheil Chemical Corp.

SODIUM ZINC CHROMATE, BASIC

$Na_2O.4ZnO.4CrO_3 \cdot 3H_2O$. M.W., 841.61; D., 3.24; slightly soluble in water, with partial hydrolysis in hot water. Finely crystalline bright yellow powder. Chemical properties similar to the corresponding potassium salt, zinc yellow. Suggested uses: corrosion inhibitive applications similar to zinc yellow, in paints or other systems where a more soluble compound is required, or where the presence of potassium is objectionable. It may possess mildew-inhibiting and fungicidal properties. Available in pilot plant quantities. Mutual Chemical Co. of America.

STANNIC IODIDE

SnI_4. M.W. 626.38. Red crystals or yellow powder. Melts about 143°C. Hydrolyzed by water. Soluble in alcohol, benzene, chloroform, ether and carbon disulfide. Available in laboratory quantities. City Chemical Corp.

STANNOUS IODIDE

SnI_2. M.W. 372.54. Red crystals or orange powder. Hydrolyzed by water. Soluble in solutions of alkali chlorides and iodides also soluble in benzene, chloroform, carbon disulfide. Available in laboratory quantities. City Chemical Co.

SUBERIC ACID

$COOH\ (CH_2)6\ COOH$ M.W. 174.19. Colorless needles, M.P.-140°C. Soluble in alcohol, very slightly soluble in water. Manufactured by new synthetic process. Suggested uses:-To form

esters, acid halides, metallic salts, amides, and other organic chemicals and synthesis purposes. These derivatives are useful as plasticizers, intermediates, dyestuffs, alkyd resins, polyesters, complex pharmaceuticals, low temperature lubricants, perfumes, surface coatings, etc. Available in semi-commercial quantities. The C. P. Hall Co.

SULFASAN R: (4, 4'-Dithiodimorpholine)

Sp. G. @ 25°C. 1.29; colorless crystals; M.P. 123-125°C.; Very soluble in hot acetone, hot alcohol, ethyl acetate, hot heptane, chloroform, benzene; soluble in ether; insoluble in water. Suggested use: As a vulcanizing agent for natural and synthetic rubbers. Available in commercial quantities. Monsanto Chemical Co.

TETRAHYDROPYRAN

less liquid; ether-like odor; Sp.G., 0.8814 @ 20°/4°C.; R.I., 1.420 @ 20°C.; B.P., 87-89°C. (760 mm.); Reid Vap. P., 2.4 p.s.i.; freezing pt., -51°C.; flash pt. (Tag closed cup), 3°F.; sol. in water, 8.7% by wt.; miscible with common organic solvents. Chemical properties: Substitution of chlorine yields chlorotetrahydropyrans; reacts with acid chloride to form haloamyl esters; conversion to dihalides such as 1,5-dibromopentane and 1,5-dichloropentane can be affected; ammonia and aliphatic and aromatic amines yield piperidine and substituted piperidines. Suggested uses: Solvent for resins, plastics, and rubbers; chemical intermediate; reaction medium for chemical processes such as Grignard reactions. Available in semi-commercial quantities. E. I. du Pont de Nemours & Co.

TETRAMMONIUM PYROPHOSPHATE

$(NH_4)_4P_2O_7$. M.W. 246; Typical analysis: NH_3, 27.7%; P_2O_5, 57.8%. White crystalline solid; Extremely soluble in water; pH of a 1% solution, 8.3; Suggested uses: Water softener and emulsifier in applications where sodium phosphates may be objectionable. Available in small quantities. Monsanto Chemical Co., Phosphate Division.

TETRASODIUM MONOPOTASSIUM TRIPOLYPHOSPHATE

Formula: $Na_4KP_3O_{10}$. Wt. 384. Melting point: 580-600° C. Density, 2.55. A white crystalline solid. Solubility in water, 30 grams in 100 ml at 26° C. pH of a 1% solution, 9.5-9.7. Suggested uses: As a builder for soaps or synthetic detergents, a sequestrant, and as a deflocculating agent for water suspensions of solid particles wherever its greater solubility compared with sodium tripolyphosphate is desired. Available in commercial quantities. Victor Chemical Works.

TOLUENESULFONYL FLUORIDE

A clear to reddish liquid, boiling from 217° C to 237°C. Possesses good heat stability. The side chain to this compound is readily chlorinated when catalyzed by either ultraviolet light or iron chloride. Less than 1 percent hydrolysis takes place after 20 hours at 25°C. or after one hour at 100°C. Possible interest in organic synthesis. Available in pilot plant quantities. Pennsylvania Salt Manufacturing Co.

TOLUIDINE BLUE O PURIFIED

M. Wt. 305.85 as the Hydrochloride and 638.86 as the Sulfate Complex (2 mols of color + 1 mol H_2SO_4). Soluble in water and organic solvents. Suggested use: As a pharmaceutical. Available in experimental quantities. National Aniline Division, Allied Chemical & Dye Corp.

TRIALLYL CYANURATE

$(C_3N_3(OCH_2CH{=}CH)_3)$. M.W., 249.26; colorless liquid; B.P., approx. 120°C. at 5 mm.; density 1.1133 g./cc. at 30°C.; R.I., nD^{30} 1.5049; insoluble in water, miscible with most organic solvents. Chemical properties: Undergoes polymerization and copolymerization with other monomers in the presence of free radical catalysts. Resinous products can also be made by ester interchange with glycols. Suggested uses: Monomer or co-monomer for resin compositions requiring good heat and chemical stability. Its use in laminates, molding compounds, coating compositions, adhesives, and cast articles is suggested. Available in trial lot quantities for experimental investigation. American Cyanamid Co.

TRI-2-ETHYLHEXYL PHOSPHITE

$(C_8H_{17}O)_3P$. M.W., 418.6; Sp.G., 0.902 at 20°/4° C.; R.I., 1.4494 at 20° C.; B.P., 163-4°C. (0.3 mm.); insol. in water, very slowly hydrolyzes, miscible with alcohol, acetone, benzene, ether, heptane, carbon tetrachloride, and most of the common organic solvents; flash point, 185°C.; fire point, 205°C.; odor, mild, not unpleasant; colorless liquid. Chemical properties: Undergoes selective reactions with organic and inorganic reagents and is useful in preparing phosphates, phosphonates, thiophosphates, pyrophosphites, hypophosphates, and other organic compounds of phosphorus for use in dyestuffs, pesticides, pharmaceuticals, lubricants, and plastics. Available in semi-commercial quantities. Virginia-Carolina Chemical Corp.

TRIETHYL PHOSPHITE

$(C_2H_5O)_3P$. M.W., 166.2; Sp.G., 0.969 at 20°/4°C.; R.I., 1.4131 at 20°C.; B.P., 65°C. (24 mm.); sl. sol. in water, hydrolyzes, miscible with alcohol, acetone, benzene, ether, heptane, carbon tetrachloride, and most of the common organic solvents; flash point, 55°C.; fire point, 70°C.; odor, sweet, characteristic; colorless liquid. Chemical properties: Undergoes selective reactions with organic and inorganic reagents and is useful in preparing phosphates, phosphonates, thiophosphates, pyrophosphites, hypophosphates, and other organic compounds of phosphorus for use in dyestuffs, pesticides, pharmaceuticals, lubricants, and plastics. Available in semi-commercial quantities. Virginia-Carolina Chemical Corp.

TRIFLUOROACETIC ACID

CF_3CO_2H. M.W., 114.02; Sp.G., 1.4890 @ 20°/4°C.; R.I. 1.2850 @ 20°C.; B.P., 71.1°C. @ 734 mm.; F.P., —15.6°C.; Surf. ten., 15.0 dynes/cm. @ 20°C.; colorless liquid; strong, pungent odor. A strong acid; almost completely ionized in water. Miscible with water, ether, acetone, alcohol, benzene, carbon tetrachloride. Chemical properties: Undergoes most of the usual reaction of carboxylic acids. Alcohols, amines, aldehydes, ketones, amides and nitriles containing CF_3— groups can be prepared. Suggested uses: Applications where a strong, nonoxidizing acid is required. Provides a means of introducing CF_3CO—, CF_3CH_2—, and CF_3CH= groups into organic molecules. As a condensing agent it has advantages over sulfuric acid and aluminum chloride in that oxidation and rearrangement side reactions do not take place. Trifluoroacetic anhydride has been found to be an effective esterification promotor. Available in commercial quantities. Minnesota Mining & Manufacturing Co.

2, 4, 6-TRIMETHYL-1, 2, 5, 6-TETRAHYDROBENZALDEHYDE

M. W. 152.23; Sp. G., 0.9195 @ 20°/20°C.; B.P., 204.5°C. (760 mm.), 115°C. (50 mm.), 79°C. (10 mm.); R.I., 1.4684 @ 20°C.; V.P., 0.3 mm. Hg at 20°C.; Fr. P., —41.9°C.; Visc., 2.3 cps. @ 20°C.; Heat of Vaporization, 131 B.t.u./lb. @ atm.; sol. in water, <0.01% by wt. @ 20°C., sol. water in, 0.3% by wt. @ 20°C.; color, water white. Chemical properties: the ring may be hydrogenated to form the cyclohexyl derivative; the aldehyde group may be condensed with ketones and amines. Uses: preparation of odorants, lubricating oil additives, and pharmaceuticals. Availability: research quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

TRIOL 230

Sp. G., 1.081 @ 20°/20°C.; B.P., 196°C. (5 mm.); V.P. <0.01 mm. Hg @ 20°C.; Fr. P., sets to a glass below —5°C.; Visc., 6872 cps. @20°C.; R.I., 1.4767 @ 20°C.; Fl. P. 395°F. (Cleveland Open Cup); Miscible in all proportions with water at 20° C.; Color, water-white. Chemical properties: Has three primary hydroxyl groups that may be esterified easily. Uses: Plasticizer for casein, zein, and other water-soluble resins; softener for cellophane and tobacco; intermediate for the preparation of alkyd and other synthetic resins, high boiling plasticizers for nitrocellulose, vinyl, and polyamide resins; suggested for use as a solvent and coupler in protective coatings, special hydraulic fluids, metal cleaners, adhesives, textile dyes, and duplicating fluids. Available in semi-commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

TRI-N-PROPYL PHOSPHATE

Formula: $(C_3H_7O)_3PO$. M.W., 224. B.P., 97°C. at 4 mm. Specific Gravity 1.002 at 25/4°C. Refractive index, $n^{25}D$ 1.4150. A water white liquid. Soluble in common organic solvents. Slightly soluble in water. Suggested uses: Plasticizers, solvents. Available in semi-commercial quantities. Victor Chemical Works.

TRISODIUM DIPOTASSIUM TRIPOLYPHOSPHATE

Formula: $Na_3K_2P_3O_{10}$. M.W., 400. M.P., 620-640°C. Density, 2.48. A white crystalline solid. Solubility in water, 80 grams in 100 ml. at 26°C. pH of a 1% solution 9.5-9.7. Suggested uses: The greater potassium content results in over twice the total solubility in water as compared with tetrasodium monopotassium tripolyphosphate. It is recommended for use where greater solubility is an advantage, with the usual excellent detergent building, deflocculant, and sequestrant characteristics of the polyphosphates. Available in commercial quantities Victor Chemical Works.

VINYL BUTYL "CELLOSOLVE"*

M.W., 144.21; Sp. Gr., 0.8654 @ 20/20°C.; B.P., 88°C. (50 mm.), 56°C. (10 mm.), decomposes at 760 mm.; R.I., 1.4213 @ 20°C.; V.P., 1.2 mm. Hg @ 20°C.; Fr. P. —71°C.; Visc., 1.04 cps. @ 20°C.; sol. in water, 0.20% by wt. @ 20°C.; sol. of water in, 0.50% by wt. @ 20°C. Chemical properties: Undergoes reactions typical of compounds containing the ethylenic linkage, such as addition of halogens, hydrogen halides, alcohols, hydrogen cyanide, and acids; polymerizes alone and copolymerizes with other ethylenic monomers. Uses: Pharmaceutical synthesis; preparation of polymers and copolymers for use as pressure sensitive adhesives, laminating resins, coating resins, and vicosity-index improvers for hydraulic fluids. Available in research quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

4-VINYLPYRIDINE

Formula: C_7H_7N. M.W., 105.1; B.P. at 150 mm., 121°C.; density at 20°/20°C., 0.988; refractive index at 20° C., nD, 1.5525; sol. in 100 g. water at 20°C., 2.91 g.; sol. of water in 100 g. at 20°C., 42.3 g.; purity, 95% minimum. 4-Vinylpyridine polymerizes to give hard, transparent, thermoplastic resins of relatively high softening point. Co-polymers of 4-Vinylpyridine with styrene and acrylonitrile have been prepared. The presence of the pyridine nitrogen in the polymers and co-polymers of 4-Vinylpyridine imparts to them an affinity for acid dyestuffs. 4-Vinylpyridine is a starting material for the synthesis of pyridine derivatives. 4-Vinylpyridine monomer, both the liquid and its vapor, are irritants to the skin, eyes, and respiratory tract. Avoid contact with the liquid and prolonged exposure to high vapor concentrations. Available in drum quantities. Reilly Tar & Chemical Corp.

2, 6-XYLENOL

Formula: $C_8H_{10}O$. M.W., 122.08; B.P. 201.1°C. (760 mm.); F.P. 45.2°C; sol. in 100 g. of water at 20°C., 0.9 g.; purity, 95%. Available from semi-works in drum quantities. Reilly Tar & Chemical Corp.

ZINC ARSENATE (ORTHO)

White powder of variable composition. Insoluble in water. Soluble in caids, alkali hydroxides and ammonia. Suggested use: Insecticide. Available in pilot plant quantities. City Chemical Corp.

ZINC RICINOLEATE

Fine, white powder. Odorless, or having only a slight odor of fatty acid. M.W., 655; M.P., 92°C.; Bulk density, .25 gr./cc.; Sp. Gr., 1.16 @ (25°/25°C.); 90% passing 200 mesh sieve. Suggested uses: Anti-blocking agent, fungicide, emulsifier, waterproofing, cosmetics, lubrication. Available in commercial quantities. The Baker Castor Oil Co.

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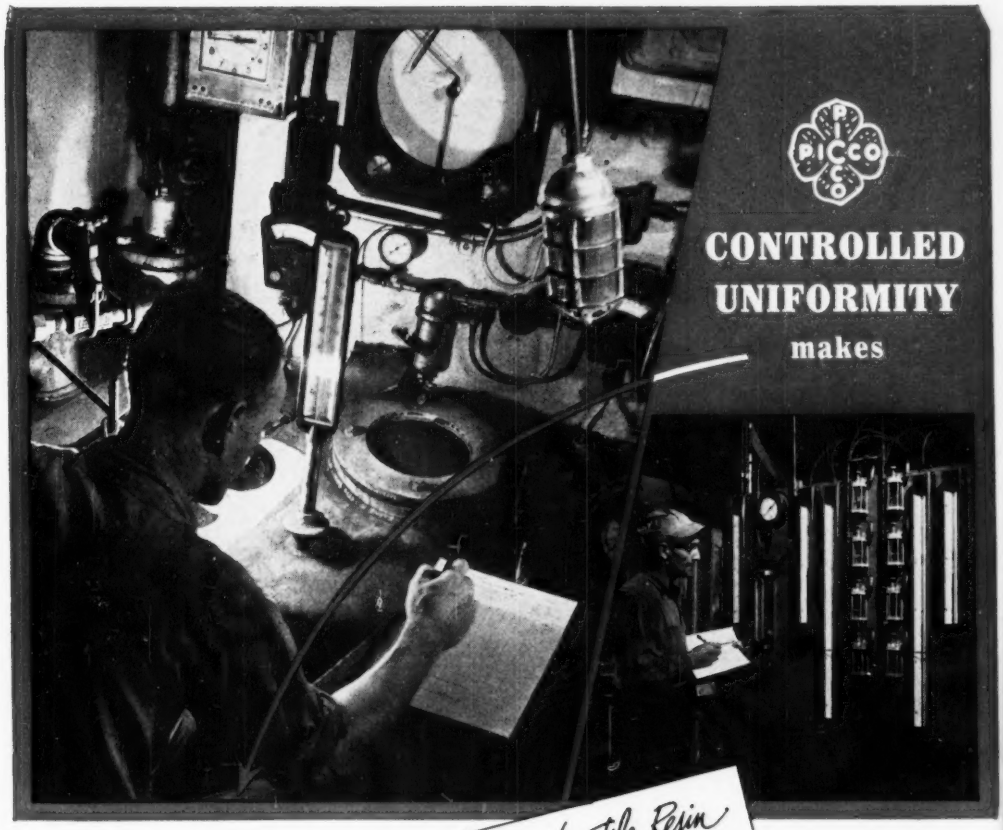
* Trade-mark



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PICCOLYTE

The Versatile Resin

dependable

You are assured of dependable uniformity when you use PICCOLYTE, because of the rigid control of every step of manufacture. The photograph above shows the controls of the Polymerizer, the kettle in which resin is made from Pinene.

Manufacturing equipment is of the most modern design, and highly perfected instrumentation procedure permits operators to keep the material under constant observation during processing.

PICCOLYTE is a versatile resin, having properties that make it ideally suited for a wide variety of products.

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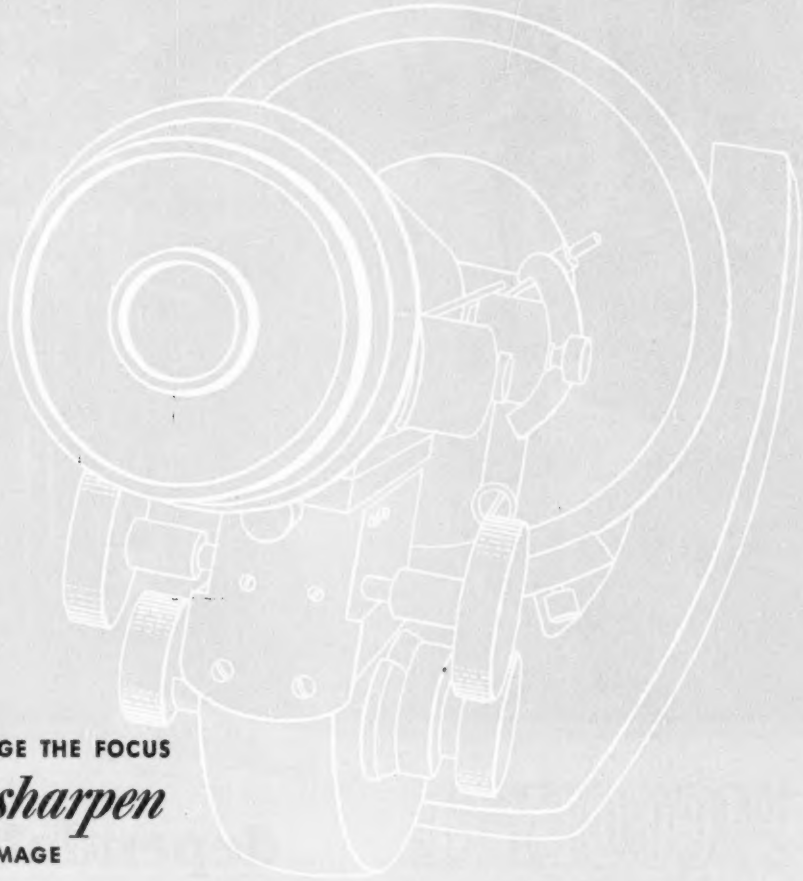
Clairton, Pennsylvania
... Plants at Clairton, Pa., West Elizabeth, Pa.; and Chester, Pa.

Distributed by Pennsylvania Falk Chemical Co., Pittsburgh 30, Pa. and Harwick Standard Chemical Co., Akron 5, Ohio



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ORGANIC INTERMEDIATES • INORGANIC CHEMICALS • CHEMICALS FOR ELECTRONIC USES • METALLIC SOAPS • ANALYTICAL REAGENTS • PHOTOGRAPHIC CHEMICALS

• MANUFACTURERS OF FINE CHEMICALS FOR INDUSTRY • SINCE 1867 •

SPECIALTIES

ACRAWAX C T

Synthetic organic amide type wax; M.P. 140°-142° C; hard, non brittle; color, brown; Sp. g. at 25° C, 0.97; flash point, 285° C; acid value, 10 max.; water and hydrocarbon insoluble. Use: lubricant for steel wire drawing, rubber and plastics; as insulating wax, detachiner, and antiblocking agent for rubber and plastics. Available in commercial quantities. — Glyco Products Co., Inc.

AGEBEST 1293-22A ANTIOXIDANT DISPERSION

It is efficient, nonstaining and non-discoloring. Used with natural and/or synthetic rubber latices for dipping, molding, saturating, coating and adhesive applications. From ¼ to 2% of AGEBEST solids on rubber solids may be used depending on service conditions. American Resinous Chemicals Corp.

ALIZARINE SAPPHIRE AR

A non-dusting, acid blue of the Anthraquinone group. Possesses excellent solubility, very good level dyeing and good neutral dyeing properties. It also possesses good fastness to carbonizing and light and excellent fastness to water, sea water, stoving, acids and rubbing. Use: either as a self shade or in combination with other dyes of similar fastness in the coloring of carpet yarns or the piece dyeing of ladies dress goods. National Aniline Division, Allied Chemical & Dye Corp.

ALRODYNE G

A polyethyleneglycol fatty ester, agricultural emulsifier with strong aphicidal action. Use: for formulations of quick breaking emulsions of DDT, Lindane, Aldrin and Parathion. Available in commercial quantities. Alrose Chemical Co.

ALRODYNE 97

A complex polyethyleneglycol ester for agricultural emulsifier use; possesses strong aphicidal action. Use: preparation of 40% and 85% 2,4D ester concentrates. Available in commercial quantities. Alrose Chemical Co.

ALROMINE RU-100

A nonionic substantive softener for cellulose, protein and synthetic fibres; compatible with anionic or cationic surface-active agents, excellent scorch resistance, no chlorine retention, no effect on absorbency. Use: softening agent for textile fibres, fat liquoring agent for leather; plasticizer for paper coatings; softeners for diapers, bed sheeting, linens; formulation of hair rinses and waving preparations. Available in commercial quantities. Alrose Chemical Co.

AMBERLITE IRA-410

Strongly basic, amine type anion exchange resin, supplied as the chloride salt. Uniform, attrition resistant, granular particles, shipped in a moist, completely swollen condition. Density: 42 pounds per cubic foot. Moisture content: 35-45%. Screen grading (wet): 20-50 mesh (U. S. Standard Screens). Characterized by high efficiency at low regenerant levels. Use: Monobed and multiple-bed water conditioning systems, for complete deionization, including the removal of silica, carbon dioxide, and sulfides. Available in carload quantities. Rohm & Haas Co.

AMBERLITE IRA-410 (OH)—ANALYTICAL GRADE

Strongly basic, amine type anion exchanger, supplied in the hydroxyl form. Moist, bead-like particles with effective size of 0.45 mm. and column density of 0.67 grains/ml. Use: in chemical analysis for adsorption of anions from acid, neutral, and alkaline solutions. Effects virtually 100% removal of phenol, carbon dioxide, silica, hydrogen sulfide, phosphates, borates, cyanides, etc. Available in commercial quantities. Rohm & Haas Co.

ANSUL BLO

A non-toxic, sponge rubber blowing agent that is non-discoloring and odorless. It is a uniformly sized, white, dry powder made water repellent to resist lumping and caking. Use: to produce sponge with such synthetics as GR-S and some of the Neoprenes. Ansul Chemical Co.

ANTIOXIDANT 2246

2, 2' - Methylenebis (4-methyl-6-tert-butylphenol). Use: non-staining and non-discoloring antioxidant for rubber. Also for use in petroleum products, animal and vegetable fats and oils, and soaps. Availability: Commercial quantities. American Cyanamid Co.

ARAMITE-15W

Dry wettable powder, containing 15% by weight 2-(p-*tert*-butylphenoxy) isopropyl 2-chloroethyl sulfite as the active ingredient. An outstandingly effective miticide for use on a wide variety of crops, including citrus, cotton, deciduous fruits, ornamentals, and vegetables. Will control citrus bud mite, citrus red mite (purple mite), clover mite, (brown mite), European red mite, Lewis mite, Pacific mite, red spider mite on cotton, six-spotted mite, spruce mite, two-spotted mite (including Parathion resistant variety), and Willamette mite. Available in larger quantities. Naugatuck Chemical Division, U. S. Rubber Co.

ARCCO 554-11 NEOPRENE LATEX ADHESIVE

A new neoprene latex adhesive. Use: Bonding leather, paper, rubber and similar materials. It provides high solids with dry tack and excellent bond strength. American Resinous Chemicals Corp.

ARCCO 717-43 ADHESIVE FOR KRAFT TO ALUMINUM FOIL

This adhesive provides excellent bond, flexibility, and good coverage. Use: On specification barrier wrap materials as well as ordinary civilian uses. American Resinous Chemicals Corp.

ARCCO 980-21D ADHESIVE

The product contains 62% solids, has a pH of 9 to 10. Viscosity is 175,000 cps, and may be reduced by adding water. Use: As a laminant for polyethylene to kraft. American Resinous Chemicals Corp.

ARCCO 1041-21 LATEX TACKIFIERS

Tackifier for natural rubber latex for compounding industrial adhesives. It imparts increased cohesion, specific adhesion; has high bond strength and dry tack. Use: Adhesive for leather, articial leather, paper fabric, Saran, Pliofilm, metal foils, cellulose acetate and coated surfaces. American Resinous Chemicals Corp.

ARCCO 1044-25D BASE COMPOUND FOR TILE CEMENT

A base compound for mastic tile cement manufacturers. It contains necessary base latex and tackifiers. It is capable of further loading or modification to meet the customer's needs. American Resinous Chemicals Corp.

ARCCO 1261-12A HEAT SEAL COATING FOR FOIL

ARCCO 1261-12A provides a strong bond, it has good flexibility, and excellent heat seal properties. Use: Government specification barrier wrap materials. American Resinous Chemicals Corp.

ARCCO 1294-32 CURING TYPE GR-S LATEX COMPOUND

Compound is available in various viscosities and is capable of modification by addition of pigments or other types of loading. Use: Fabric coating application—knife application. American Resinous Chemicals Corp.

ARCCO 1295-39A SEAMING ADHESIVE

A seaming adhesive whose laminations withstand the migration of asphalt oils which tend to destroy adhesive bonds. Use: As adhesive for asphalt laminated wet strength bond. American Resinous Chemicals Corp.

ARCCO VINYL CORROSION RESISTANT FINISHES

This system consists of three coats; conditioner, intermediate and top coating. These may be applied by brush or spray. The advantages are the rapid drying rate and increased life of the finished coating over ordinary coatings. Use: As a protective coating against corrosion conditions for ship bottoms, chemical tank trucks, industrial maintenance, storage tanks, and bridges, as well as dairy, brewery, and food packing machinery. American Resinous Chemicals Corp.

AROPOL 866-P-50

A copolymer styrenated, oxidizing alkyd, non-castor type, short-medium oil length. Non-volatile, per cent by wt., 49-51; solvent, pet. spirits; viscosity (G.H.), Z₃-Z₄; acid no. of non-volatile, 3-8; color (Gardner std '33) maximum, 8; approx. range of wt.-gallon @ 25° C., 7.75-7.85 lbs.; rosin derivatives, none; oil length, short-medium. Use: Grind charge of government specs MIL-E-10687 (ORD); also for industrial and shelf goods finish. U. S. Industrial Chemicals, Inc.

AROPOL 881-X-60

Copolymer styrenated, oxidizing alkyd, non-castor type, short oil length. Non-volatile, per cent by wt., 59-61; solvent, xylol; viscosity (G.H.), Z₁-Z₃; acid no. of non-volatile, 3-8; color (Gardner std '33) maximum, 8; approx. range of wt.-gallon @ 25° C., 8.35-8.45 lbs.; rosin derivatives, none; oil length, short. Use: To thin down government spec. MIL-E-10687 (ORD); also for hammered effect, and fast dry industrial finishes. U. S. Industrial Chemicals, Inc.

AROFLAT 3050-P-40

Non-phthalic, non-castor, modified alkyd resin. Viscosity (G.H.), H-L; A V., 10 max.; color (Gardner), 10 max.; wt. per gal., 7.2-7.3 lbs., solids, 39-41%; solvent, petroleum thinner. Use: For producing non-penetrating, self-priming, flat wall finishes. U. S. Industrial Chemicals, Inc.

AROPLAZ 1366-X-60

Medium-short phenolic modified, oxidizing alkyd, designed as single resin component aircraft primer spec. MIL-P-6389A, Type I, also automotive primers non-lifting to lacquer re-coat. Non-volatile, 59-61%; solvent, xylol; viscosity (G.H.), Z-Z₂; acid no. of non-volatile, 18-25; color (Gardner Std. '33), 7-9; wt/gallon @ 25° C. (solution), 8.45-8.55 lbs.; oil length, med.-short; resin modification, phenolic. Use: As a single resin component aircraft primer spec. MIL-P-6889A Type I; also automotive primers non-lifting to lacquer re-coat. U. S. Industrial Chemicals, Inc.

AROPLAZ 1388-M-65

Long oil, pure oxidizing alkyd. G. H. viscosity, U-X; acid value (solids), 4-8; color (Gardner Std. '33), 9-11; wt./gal. @ 25° C., 7.65-7.75 lbs. Use: For ready-mixed aluminum paints of excellent stability, leaf retention, and durability. U. S. Industrial Chemicals, Inc.

AROPLAZ 1389-M-75

Non-phthalic, long oil, oxidizing resin. Excellent stability and leaf retention, with good durability. G. H. viscosity, Y-Z1; acid value (solids), 10-25; color (Gardner Std. '33), 8-10; wt./gallon @ 25° C., 7.85-7.95 lbs. Use: For ready mixed aluminum paints. U. S. Industrial Chemicals, Inc.

ARWAX 717-46B HEAT SEAL PAPER COATING

A butyl rubber concentrate in high melting paraffin waxes. It is non-blocking, has high bond strength and water vapor resistance. Use: In the manufacture of hot melt heat seal paper coatings. American Resinous Chemicals Corp.

BEESWAX, SYNTHETIC, WAX NO. 22

White and yellow colors. Acid Value, 20. Saponification Number 93, Ester Number 73, Ratio Number 3.6. Has characteristics of genuine beeswax with added advantage of being always uniform in quality. Available in unlimited quantities for prompt and future shipment. International Wax Refining Corp.

BI-CON 3+1

A combination Vitamn B_{12} and antibiotic (Terramycin). Guaranteed Analysis: 3.0 milligrams Vitamin B_{12}, activity per pound and the equivalent of 1.0 gram crystalline Terramycin Hydrochloride per pound. Ingredients: Dried Terramycin whole broth, dried extracted Terramycin and Streptomycin fermentation solubles and meals, solvent extracted soybean oil meal, calcium stearate, and calcium phosphate. Use: As feed supplement in rations of chickens, turkeys,

hogs, mink, and fish. Rate of use determined by quantity of supplemental Vitamin B_{12} desired in ration. Commercially available for nutritional uses only. Chas. Pfizer & Co., Inc.

BI-CON 3+3

A combination Vitamin B_{12} and antibiotic (Terramycin). Guaranteed Analysis: 3.0 milligrams Vitamin B_{12} activity per pound, and the equivalent of 3.0 grams crystalline Terramycin Hydrochloride per pound. Ingredients: Dried Terramycin whole broth, dried extracted Terramycin and Streptomycin fermentation solubes and meals, solvent extracted soybean oil meal, calcium stearate, and calcium phosphate. Use: Feed supplement for the rations of chickens, turkeys, hogs, mink, and fish. Rate of use determined by quantity of supplemental Vitamin B_{12} desired in ration. Commercially available for nutritional use only. Chas. Pfizer & Co., Inc.

BI-CON TM-5

An antibiotic feed supplement guaranteed to contain the equivalent of 5.0 grams of crystalline Terramycin Hydrochloride per pound. Ingredients: Dried Terramycin whole broth, dried extracted Terramycin fermentation meals and solubles, dried extracted Streptomycin fermentation meal, calcium stearate, and calcium phosphate. Use: To provide extra growth stimulation in the diets of chickens, turkeys, hogs, and mink. Rate of use in chicken, turkey, and hog feeds is one to two pounds of Bi-Con TM-5 per ton of complete ration. Commercially available for nutritional use only. Chas. Pfizer & Co., Inc.

BONDING AGENT, SILICONE RUBBER, G-E 81267

Permits bond between silicone rubber and metals or ceramics that is stronger than the rubber itself. Shear strength measurements of bonds on steel are 700 lbs. per sq. in. Use: Include shock and engine mounts, improved rubber-glass laminated structures. General Electric Co. Chemical Division.

BUTACRYL, POLYCO 422N & 423NS

Acrylic-butadiene copolymers. On drying yield flexible, non-oxidizing, oil resistant films. POLYCO 422N and 423NS are free of any monomeric plasticizers and yield inherently flexible films. Technical Data Sheet P-23 describes properties, uses, and specifications. Use: As coatings & saturants by paper industries. American Polymer Corp.

CACHALOT 0-1

Oleyl alcohol, titre below 1° C., acid value 0.5, iodine number 91.7. Slightly yellow, viscous liquid. Uses: As an emulsifier, penetrant, plasticizer, anti-foam agent, and intermediate in oils, hair setting preparations, rubber emulsions, cosmetics, etc. Small quantities available early 1952. M. Michel and Company, Inc.

CACHALOT 0-4

White, odorless oleyl alcohol, acid value nil, saponification value 0.6. Use: As an emulsifier, penetrant, plasticizer, softener, stabilizer, anti-foam agent, and intermediate, whenever a high purity aliphatic C_{18} alcohol is essential in chemical processing, soap and textile specialties, drugs and cosmetics. Small quantities available early 1952. M. Michel and Company, Inc.

CARBANTHRENE OLIVE GREEN B DOUBLE PASTE

An Anthraquinone vat dye producing, on cotton or rayon, moderately bright olive green shades of the highest light fastness. It possesses good fastness to chlorine, very good fastness to washing, boiling soap, boiling soda, perspiration, water and sea water and excellent fastness to rubbing. Use: For coloring upholstery fabrics, curtains, high grade embroidery yarns and, in deep shades, for awnings. National Aniline Division, Allied Chemical & Dye Corp.

CARBANTHRENE OLIVE T PASTE

A vat dye of the Anthraquinone group producing olive-gray shades on cotton or rayon. It is applicable by the pad-jig method; also by the reduced bath method either in open tubs or in pressure machines. Dyeings so produced are characterized by very good fastness to acids, alkalies, boiling soap, chlorine, rubbing and hot pressing; also excellent fastness to stoving, cross dyeing, mercerizing, perspiration, water, washing and light. National Aniline Division, Allied Chemical & Dye Corp.

CARBANTHRENE RED FBB DOUBLE PASTE

A red, vat dye of the Anthraquinone group which reduces readily to a dull brown leuco. It possesses good fastness to mercerizing; very good fastness to acids, alkalies, rubbing, chlorine, peroxide and light and excellent fastness to washing, boiling soap or soda, water, sea water, cross dyeing, stoving and perspiration. Use: In the reduced state it is well adapted for the machine dyeing of cotton in raw stock, yarn or piece; it can also be applied by the pigment padding method to yarn or piece goods, and is suitable for printing. National Aniline Division, Allied Chemical and Dye Corp.

CASTORWAX, POWDERED

A hydrogenated castor oil, white, waxy powder. M.P. 86° C.; iodine value 5.0; sap. value 180. Suggested uses: Anti-blocking agent; binder; carbon paper; cosmetics; potting compound; drawing compounds; duplicating items; gasket compositions; hot melts; impregnants; greases; polishes; wax compositions; waterproofing; wire drawing. Available in commercial quantities. The Baker Castor Oil Co.

CELOGEN

A blowing agent for natural and synthetic rubber, plastics, and plastisols. It is non-toxic, non-discoloring, non-staining and odorless. Can be used alone or as an auxiliary with sodium bicarbonate, for fine uniform cell structure—open or cellular. Especially recommended for continuous cure, fine sheet sponge; rug underlay, sate for floor finishes; upholstery materials like arm-rests, cushions; sponge gaskets contacting lacquered finishes, white or light-colored sponge, free of light discoloration; sponge soling; general purpose molded sponge requiring sharp definition; low-density cellular expanded plastics for insulation, or buoyant type products for military or commercial use. Commercially available. Naugatuck Chemical Division, U. S. Rubber Co.

CHEL 242P

A complexing agent and metal solubilizer in non-hygroscopic powdered form designed especially for use in strongly alkaline solution. It forms complexes with iron, chromium, nickel, cobalt, lead, manganese, copper, cadmium and zinc in 1% to 30% sodium hydroxide. Suggested uses: For decolorizing and clarifying caustic soda, potash, sodium sulfide and sulfhydrate; for use in desulfurizing rayon, in dehairing solutions, metal cleaning, mineral separations. Available in commercial quantities. Alrose Chemical Co.

CHEMIGUM LATEX 235AHS

An aqueous dispersion of a 55/45 butadiene-acrylonitrile copolymer; total solids, 40-45%; specific gravity of dried solids, 0.99; stabilizer, ammonia soap; viscosity, 15-35 cps.; pH range, 10-12; color, white. Use: In coating, saturating, and compounding applications requiring unusual adhesion or resistance to oils, greases, alcohols, glycols, and most solvents. Commercially available. The Goodyear Tire & Rubber Co., Inc.

CHEMIGUM LATEX 235C

An aqueous dispersion of a 55/45 butadiene-acrylonitrile copolymer; total solids, 30.25%; specific gravity of dried solids, 0.99; stabilizer, synthetic anionic; viscosity, 10-30 cps.; pH range, 9-11; color, white. Anionic stabilizer insures stability in process which tend to increase the hydrogen ion concentration of the latex. Use: Are similar to those for CHEMIGUM LATEX 235AHS. Commercially available. The Goodyear Tire & Rubber Co., Inc.

CHEMIGUM LATEX 235CHS

An aqueous dispersion of a 55/45 butadiene-acrylonitrile copolymer similar to CHEMIGUM LATEX 235C but with a solids content of 40-45%. Commertially available. The Goodyear Tire & Rubber Co., Inc.

CHEMIGUM LATEX 245AHS

An aqueous dispersion of a 67/33 butadiene-acrylonitrile copolymer; total solids, 40-45%; specific gravity of dried solids, 0.98; stabilizer, ammonia soap; viscosity, 15-35 cps.; pH range, 10-12; color, white. Use: In dipping, paper impregnation, fabric sizing and paper coating. Commercially available. The Goodyear Tire & Rubber Co., Inc.

CHEMOTHERAPEUTANT 1182, EXPERIMENTAL

4-chloro-3, 5-dimethylphenoxy ethanol. Moist white crystalline solid. M.P. 42-44° C.; mild phenolic odor; 0.01% by weight soluble in hot water, greater than 10% by weight soluble in acetone, methyl isobutyl ketone, ethanol, xylol, carbon tetrachloride and chlorinated hydrocarbons, insoluble in refined kerosene. Tests indicate it to be effective in the control of certain vascular wilt diseases of plants. Experimental use: For the control of Fusarium wilt of carnations, and of other fungus, bacterial, and virus diseases of root and vascular systems of plants. Availability: Research quantities for further testing. Carbide and Carbon Chemicals Co., Division Union Carbide and Carbon Corp.

CHEMOTHERAPEUTANT 1207, EXPERIMENTAL

2-norcamphanemethanol. Light straw-colored liquid; B.P. 83° C. (5 mm.); Sp. G., 1.005 @ 20°/20° C.; 0.1% by weight soluble in hot water. At least 5% soluble in acetone, methyl isobutyl ketone, ethanol, xylol, chlorinated hydrocarbons, and carbon tetrachloride; insoluble in refined kerosene. Tests indicate it to be effective for the control of certain vascular wilt diseases of plants. Experimental use for the control of Fusarium wilt of carnations, and of other fungus, bacterial, and virus diseases of root and vascular systems of plants. Availability: Research quantities for further testing. Carbide and Carbon Chemicals Co., Division Union Carbide and Carbon Corp.

CHROMOLAN RED 3RB

Chromolan Red 3RB is a non-dusting, pre-metallized acid red for wool producing soft pink to red shades of good fastness to domestic washing, mill washing and scouring, perspiration and hot pressing and excellent fastness to crocking, steaming, acids, alkalies, water, sea water and stoving. Use: For piece dyeing of ladies dress goods as well as for dyeing carpet yarns and knitting yarns for bathing suits, sweaters and hosiery. National Aniline Division, Allied Chemical & Dye Corp.

COATING INTERMEDIATE, G-E R-108

Baking type resin combining outstanding chemical resistance with flexibility and heat resistance. Based on selected phenol derivatives. Coatings formulated with R-108 may be pigmented in colors. Standard equipment and conventional techniques may be used for applying and baking R-108 coatings. Imparts high resistance to alkalies, acids, oxidizing agents, solvents, and salts. Has unusual stability to ageing at elevated temperatures. Use: Drums, tank cars, chemical tanks, process equipment. Chemical Division, General Electric Co.

"CRAG"* HERBICIDE 1

Sodium-2, 4-dichlorophenoxyethyl sulfate sol. in water, up to 25% by wt. @ 20°C.; LD_{50} M. P., 170°C.; (single oral dose toxicity) to rats, 1.4 g./kg.; fine powder; color, white. This chemical is extremely promising as a pre-emergence herbicide. It seems to become herbicidal only upon contact with soil. Hence, its use offers little or no drift hazard to surrounding crops. Uses: Pre-emergence control of weeds in strawberries. Being tested experimentally on sweet corn, asparagus, and other crops. Availability: Commercial quantities. Carbide and Carbon Chemical Co., a Division of Union Carbide & Carbon Corp.

DEFOAMER E. D.

A brown viscous material consisting of high molecular weight esters and incorporated particles. May be dispersed in water latex based paints either directly or premixed. Satisfactory paints have been prepared commercially using as little as one-tenth of one percent. Defoamer E. D. is completely stable and requires no particular care on storage, nor does it have any adverse effect on the stability of the paint in which it was used. Defoamer E. D. is being tested in the textile, glue and pharmaceutical industries. Limited commercial availability. El Dorado Oil Works.

DEFOAMER, SILICONE EMULSION, XE151

Water dilutable silicone defoamer; contains 30% Dow Corning Antifoam A, water and emulsifying agents widely used in the food industry. Use: In beverages, foods and pharmaceuticals at concentrations up to 10 ppm. This new emulsion speeds dispersion in aqueous sytems, eliminates solvent carriers. Commercially available. Dow Corning Corp.

DETERGENT LIQUID (High Viscosity)

A formulated liquid detergent based on a nonionic surface active agent. A high viscosity product especially adapted for use in liquid dispensers. Suggested Use: For Washing hands. Availability: Research quantities. Monsanto Chemical Company, Phosphate Division.

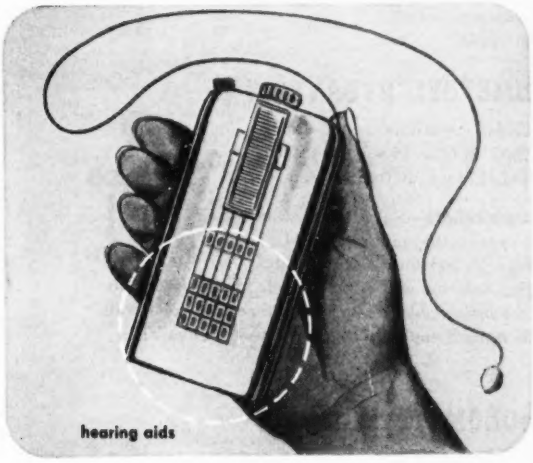
* Trade-mark

Inquire first of **Baker** when you need

POTASSIUM HYDROXIDE

for DRY CELL BATTERIES

to a defined purity in TONNAGE lots



hearing aids

walkie-talkies

...for civilian needs

Dry batteries for hearing aids... or for walkie-talkies...how vital they are in today's production!

And the need for them—particularly for defense purposes—will grow even greater.

In the manufacture of dry batteries you need Potassium Hydroxide not only in *quantity, but to a defined purity.*

You can obtain this defined purity in tonnage lots by purchasing Baker Potassium Hydroxide.

Baker Potassium Hydroxide, C. P., is always pure white—extremely low in heavy metals—low in chlorides, carbonates, sulfates, phosphates, and nitrogen. These are the qualities that make this chemical ideal for manufacturing dry cells.

...for defense needs

When you specify Baker Potassium Hydroxide, you can be sure of premium quality at standard price—and of efficient, economical results. Whatever your chemical needs—it will pay you to inquire first of Baker.

J. T. Baker Chemical Co., *Executive Offices and Plant, Phillipsburg, N. J.*

Baker CHEMICAL

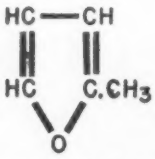
Baker Chemicals

REAGENT • FINE • INDUSTRIAL

6 NEW DU PONT CHEMICALS

Which one can help you?

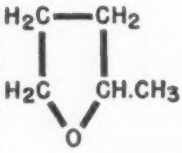
2-METHYL FURAN



Colorless liquid. B.P. 64°C. Freezing pt. -88.68°C. Flash pt. -27°C. Insoluble in water. Miscible with most organic solvents.

Intermediate—Reacts by addition, substitution, and fissure of the ring.

2-METHYL TETRAHYDROFURAN

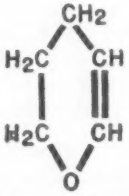


Colorless liquid. B.P. 80°C. Freezing pt. -136.1°C. Flash pt. -11°C. Solubility in water at 25°C., 13.87% by weight. Miscible with most organic solvents.

Solvent for many natural and synthetic resins. Useful as an extraction medium.

Intermediate—Reacts by substitution and fissure of the ring.

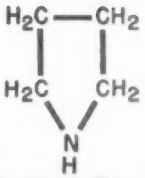
DIHYDROPYRAN



Colorless liquid. B.P. 86°C. Flash pt. -18°C. Solubility in water at 20°C., 3 g./100 cc. Miscible with common organic solvents.

Intermediate—Reaction of double bond yields variety of compounds. Fissure of the ring leads to alpha, omega-disubstituted derivatives. Hydrogenation gives *tetrahydropyran*, an excellent solvent and chemical intermediate. Samples of this derivative are available.

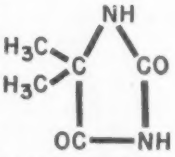
PYRROLIDINE



Colorless liquid. B.P. 86-87°C. Freezing pt. -63°C. Flash pt. 3°C. Miscible with water, forming a strongly alkaline solution. Miscible with most organic solvents.

Intermediate—Pure cyclic secondary amine. Reacts by addition, condensation, alkylation, and acylation forming compounds of possible use in the preparation of rubber accelerators, insecticides, surfactants, and pharmaceuticals.

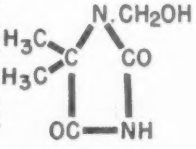
DIMETHYL HYDANTOIN



White, crystalline solid. M.P. 178°C. Soluble in water, alcohol, diethyl ether, and ethyl acetate.

Intermediate—Substitutions can be made in the imino groups. Mineral acids and dilute alkali split the ring. Reaction with formaldehyde yields *dimethyl hydantoin formaldehyde resin*, a water- and alcohol-soluble resin. Samples of this derivative are available.

MONOMETHYLOL DIMETHYL HYDANTOIN



White, crystalline solid, M.P. 99-103°C. 18.98% combined formaldehyde. Soluble in water, methanol, and acetone. Slightly soluble in ethyl acetate. Insoluble in hydrocarbons, trichlorethylene, carbon tetrachloride, and diethyl ether.

Intermediate—Reacts as a substituted hydantoin or as an odorless formaldehyde donor.

Availability—*Limited quantities of these products are available for research and development. A request on your company letterhead will bring further technical information. E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Dept., Field Research Section, Wilmington 98, Delaware.*

DU PONT ELECTROCHEMICALS

DU PONT

Better Things for Better Living . . . through Chemistry

DETERGENT LIQUID (Low Viscosity)

Light amber liquid, pH 6.2. A formulated product based on an anionic detergent. Produces a large volume of stable foam in hard or soft water and in the presence of fats and oils. Use: As a light duty household detergent. Availability: Research quantities (larger sample quantities in near future). Monsanto Chemical Company, Phosphate Division.

DRY FLO

A starch ester containing hydrophobic groups which is extremely difficult to wet with water under ordinary conditions. It has excellent flow and dusting properties. Use: For rubber dusting and compounding, as a no-offset powder, as a flatting or delustering agent in plastics and lacquers, and as a slippage agent. Available in commercial quantities. National Starch Products, Inc.

DULLATONE AN-25

A dispersion which may be applied by pad or exhaustion to acetate, Dacron and Orlon yarns or fabrics to impart durable dullness. Commercially available. Onyx Oil & Chemical Co.

EMULSIFIER P-8610

Edible polyhydric alcohol ester of saturated fatty acids. White to cream flakes. Slight fatty odor. M.P. approx. 50°C. pH (3% disp.) approx. 8.5. Dispensible in water. Uses: Emulsifier and stabilizer for cosmetic preparations and food products. Commercially available. Kessler Chemical Co., Inc.

EMULSIFIER X-15

Amber colored, oily liquid. Non-ionic, oil-in-water emulsifier. Specific Gravity 1.003. Acid number 5.0 max. F.P. Approx. 0°C. Outstanding for mineral oils. Recommended for aliphatic and aromatic solvents. Uses: Preparation of insecticide, cleaning, textile and leather treating emulsions. Commercially available. Kessler Chemical Co., Inc.

EPON® RESINS

Epon resins are offered to the surface coatings industry for the preparation of premium industrial and trade sales finishes. These resins, condensation polymers of epichlorohydrin and bisphenol, represent a new type of surface coating material. Four basic resins are available—1001, 1004, 1007 and 1009—each designed to meet the requirements of a given segment of the coatings industry. Uses: Unmodified or cold-blended Epon resins go into baking finishes for die castings and can coatings, and industrial primers. When esterified by cooking with such drying oil acids as linseed or dehydrated castor, Epon resins are the basis for varnishes, brushing enamels and other trade sales items. Cooked with slow or non-drying fatty acids, Epon resins form esters that may be used in baking finishes in combination with melamine or urea-formaldehyde resins. Finishes based on Epon resins exhibit the unusual combination of excellent adhesion, superior chemical resistance and outstanding flexibility. Shell Chemical Corp.

ERUSTO-MAX

A laundry sour with high neutralizing value and complete solubility in water. Automatically maintains souring in a neutral range in the washwheel and completes the neutralization during drying or ironing to a pH of about 5.0. Use: To reduce the possibility of flat work rolling during ironing. Commercially available. Pennsylvania Salt Manufacturing Co.

ERUSTO-RAY

A laundry sour composed of acid fluorine salts and containing Lexite, a farbric brightener. Has a high neutralizing value. Use: To prevent, or greatly retard precipitation of rust on clothing during laundering. Commercially available. Pennsylvania Salt Manufacturing Co.

"FLEXOL" PLASTICIZER R-2H

A high molecular weight polyester. Sp.G., 1.055 @ 20°/20° C.; pour point 5.0°C. (approximately 50,000 cks.); Visc., 16,520 cps. @ 20°C.; sol. in water, insoluble @ 20°C.; sol. water in, 1.0% by wt. @ 20°C.; Fl. P.; 550°F. (Cleveland Open Cup); R. I., 1.4685 @ 20°C. A non-volatile, non-marring, extraction-resistant plasticizer with good electrical characteristics. Use: As a plasticizer for vinyl chloride resins. Availability: semi-commercial qualities. Carbide and Carbon Chemical Company, a Division of Union Carbide and Carbon Corp.

"FLEXOL" PLASTICIZER 2GB

$C_6H_5COOCH_2CH_2OCH_2CH_2OCOC_6H_5$. M.W., 290.3; Sp. G., 1.1765 @ 20°/20°C.; B.P., 236.0°C. (5 mm.); V. P., 0.89 mm. Hg @ 200°C.; Fr. P., 15.9°C.; Visc 111. cps. @ 20° C.; R.I.; 1.5449 @ 20°C.; Fl. P., 555°F. (Cleveland Open Cup); sol. in water, insoluble @ 20°C.; sol. water in, 1.0% by wt. @ 20°C. Use: As a primary plasticizer for vinyl chloride resins in calendered material (film, sheeting, flooring), organoslos, or plastisols. Availability: Commercial quantities. Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corp.

FLEXRICIN 51

Clear, bright, low viscosity liquid. Viscosity 1.2 poises @ 25°C; Density 7.87 lb/ gal @ 25°C; Flash Point 400°F; Acid Value 4.0; Iodine Value 83; Sap. Value 171. Insoluble in water; soluble in all common solvents. Suggested uses: Plasticizer; textile oil ingredient; cosmetics; inks; wetting agents; polishes. Available in commercial quantities. The Baker Castor Oil Co.

FLURAL

A mixture of aluminum fluoride—sulfates such as $AlFSO_4$ and $Al_2F_4SO_4$, soluble in water to give aluminum fluoride and sulfate ions hence adaptable as a substitute for all or part of the filter alum ordinarily used in water treatment. Fluoride-aluminum ratio may be varied to fit requirements of different waters. Flural has low toxicity is equal to sodium fluoride in prevention of tooth decay, frequently may be added to water by same equipment as used for alum. Use: As agent for fluoridation and floculation in municipal water plants. Availability: Semi-commercial. Ozark-Mahoning Co.

FORMVAR 7/70

A new polyvinyl formal with higher acetate content than normal Formvar 15/95 E. Soluble in lower ketones: acetone, methyl ethyl ketone, acetyl acetone, diethyl ketone, isophorone, and cyclohexanone. Uses: As prime coat for painting on metal. Gives tough abrasion-resistant coating, particularly after baking. Also for molding powders. Available in ton lots. Shawinigan Products Co.

FOSCOAT AZ

An acid zinc phosphate solution containing an accelerator especially designed to yield an adherent crystalline coating on steel surfaces use as a parting agent in cold forming operations. The coating is highly absorbent and functions as a matrix for the adsorption and absorption of an organic lubricant. Use: As a parting agent in cold forming operations. Commercially available. Pennsylvania Salt Manufacturing Co.

FOSLUBE

A variety of types of lubricants specially formulated to work in conjunction with phosphate-coated steel surfaces in cold forming operations.

L6—A fat emulsion type lubricant that is stable for long periods of time (e.g. one year) at temperatures up to 190F. Contains a special agent to improve adherence qualities.

L3—A soap-like material containing a plasticizer and auxiliary lubricant so as to yield a pliable soap film. Adapted for deep drawing operations.

L13—A stable fat emulsion, containing a dispersed, insoluble filler. Characterized by low sedimentation rate and long range stability at temperatures up to 1—90 F. Designed for difficult deep drawing operations.

L10—A soap-like material of exceptional lime tolerance. Developed for use in wet wire drawing.

L18—A dry film lubricant applied from aqueous solution. Film-forming characteristics are emphasized. Used in severe drawing and extrusion operations.

Commercially available. Pennsylvania Salt Manufacturing Co.

FOUNDRY CORE BINDER RESIN, G-E 12353

An improved phenolic liquid core binder resin to meet critical foundry requirements. Use: Permits molding of stronger sand cores than with former phenolic resins; has higher water dilutueness and improved handling characteristics. Easy shakeout lessens danger of casting breakage. Low gas formation and higher gas permeability result in sounder and smoother castings. Chemical Division, General Electric Co.

GLIDCOL-REGULAR

A refined derivative of wood phenols. Sp. G. 15.5°C/15.5°C. 1.086, color 50 (Parlin); B. range IBP to 95% between 137°C—212°C. Uses: Effective concentrations between 0.05—0.40% on the weight of varnish is indicated. Use: As a high grade anti skinning agent in varnishes and paints. Available in commercial quantities. Glidden Co.

GLIDCOL-WW

A special refined derivative of wood phenols. Sp. G. 15.5°C/15.5°C. 0.979; color min. 50 APHA; B. range IBM to 95% 155°C-205°C. Use: As a special high grade anti-skinning agent for use in varnishes and paints where a very mild pleasant odor and waterwhite color is required. Effective concentration between 0.05% to 0.43% is indicated. Not quite as effective as Glidcol-Regulator. Available in commercial quantities. Glidden Co.

HERBICIDE EXPERIMENTAL 5722

Active ingredient, phenoxyethyl trichloroacetate. An emulsified liquid. Use: Preliminary tests indicate that it is effective for the control of weeds in table and sugar beets. Testing is suggested for the control of weeds on these crops and alfalfa, cotton, crucifers, cucurbits, and potatoes. Availability: Testing quantities only. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

HYDRICIN 1

Clear, bright, viscous oil. Density 8.13 lb/ gal @ 25°C; Acid Value 6.0; Flash Point 518°F; Viscosity 135 SUS @ 210°, 1.840 @ 100°F. Suggested uses: As a base for the manufacture of hydraulic fluids. Available in commercial quantities. The Baker Castor Oil Co.

HYDROPEL

A unique type of asphaltic emulsion. Added at the rate of 1-½ gallons per sack of cement, it resists water absorption over five times more effectively than any other admix tested. Use: As an integral admix in Portland cement concrete. HYDROPEL concrete also is very effective against alkalies and is widely used by the chemical industry for floor, walls, tanks and foundations. Commercially available. American Bitumuls Co.

HYSOL 6020

An epoxide type potting and casting resin that will cure at room temperature. Supplied as two liquid components, which are mixed together just prior to use. Castings have excellent electrical properties and chemical resistance. Use: As an adhesive, potting resin for encasing electronic components, and as a casting resin for use in the production of precision insulating components. Shrinkage is 2%. Semi-commercial. Houghton Laboratories, Inc.

HYSOL TYPE 30 ADHESIVE

A modified phenolic type adhesive containing 35% solids. Supplied as a one-package adhesive that is stable for six months. Curing temperatures varying between 215°F and 400°F can be used. Use: For bonding phenolics to each other or to a wide variety of other materials. Type 30 is particularly recommended for use in the production of aluminum sandwich structures. Commercially available. Houghton Laboratories, Inc.

INSULATING VARNISH, SILICONE

A new class H electrical insulating varnish with exceptional heat resistance, excellent moisture resistance and dielectric qualities plus improved flexibility at temperatures from —65 to 500°F. Use: To coat glass cloth and sleeving or to bond mica and mica glass products; recommended for making Class H insulation where highest flexibility over a wide temperature range is required. Commercially available. Dow Corning Corp.

IONAD 17

A fuel oil additive that prevents screen clogging. Typical Properties: Weight, 7.2 lbs. per gallon; Flash Point, >80°F. A carefully balanced blend of surface active agents and solutizers, it prevents, when added to a petroleum distillate solution, the precipitation of colloidal suspensions of tars (asphaltenes), etc., generally considered to be the cause of filter screen clogging.

In stored oil, Ionad 17 inhibits the formation and build-up, on tank bottoms, of carbonaceous deposits that require periodic cleaning. Diesel fuels containing Ionad 17 cause less injector fouling since gradual build-up of tars (asphaltenes) is prevented. Ionad 17 is stable and effective over extended periods of time. It is noncorrosive, tends to reduce rust formations in storage tanks. Amount of Ionad 17 required is usually 1.0-1.5 gallons per 100 barrels of oil; exact concentrations for any particular stock can be accurately determined by laboratory methods. Shell Chemical Corp.

KEL-F N-1 DISPERSION

Monochlorotrifluoroethylene polymer of high molecular weight colloidally dispersed in an organic thinner. This non-aqueous dispersion contains 20 to 30 percent KEL-F plastic; sp. g., 0.962-1.029 at 25°/4°C.; viscosity, 100-150 centipoises; after thinner evaporates, dry particle coating is white; settles to some extent on standing, but will readily assume original form and utility with mild stirring. Fusion of the discrete particles, applied by spray, dip or brush methods, to form a continuous protective film is accomplished by heating to 250°C. Films are built up by repeated applications of dispersion followed by fusion after each application. Use: Clarity in thin films, heat stability and chemical resistance make for an ideal protective coating. Excellent electrical properties provide for a high temperature insulation material applied from dispersion. Commercially available. The M. W. Kellogg Co.

KEL-F NW-25 DISPERSION

Monochlorotrifluoroethylene polymer of high molecular weight colloidally dispersed in an organic thinner. This non-aqueous dispersion contains 27 to 38 per cent total solids; Sp. G., 0.974-1.091 at 25°/4°C.; viscosity 100-150 centipoises; other properties similar to KEL-F N-1. KEL-F NW-25 fuses at a slightly lower temperature than KEL-F N-1 and the discrete particles are held more firmly to the surface prior to fusion. Use: Where shadp corners are encountered and one wishes to reduce creeping to a minimum; and when coating objects with rapid heat-transfer properties, such as wire coating. General uses are the same as for KEL-F N-1. Commercially available. The M. W. Kellogg Co.

KREELON CD

Sodium alkylarylsulfonate—sodium carboxymethylcellulose. Struck Density, 20-25 lbs./cu. ft.; Packed Density, 28-32 lbs./cu. ft.; pH (1% soln. 25°C.), 8-9; color, white to light cream; physical form, flakes. It is a promoted synthetic detergent and wetting agent, containing a guaranteed minimum of 38% alkylarylsulfonate and 3% carboxymethylcellulose as an inherent component of its homogeneous composition. It is designed for use alone or in a combination with alkalies or other additives. Properly substituted for another anionic detergent, Kreelon CD gives 15 to 70% improvement in soil removal, and whiteness retention properties. Uses: General household cleaners, laundry compounds, scouring powders, building maintenance cleaners, metal cleaners, dishwashing compounds, processing operations of cotton, wool and synthetics. Availability in commercial quantities. Wyandotte Chemical Corp.

LUSTREX X700 RESINS

A series of water soluble fine powder modified styrene resins, insoluble in anhydrous solvents, soluble in blends of water and solvents. Insolubilized with formaldehyde. Glycerine and water soluble glycols are efficient plasticizers. Uses: Films, adhesives, coatings, oil well muds, latex thickening, mold release coatings and dispersing agents. Laboratory and pilot plant quantities available. Monsanto Chemical Co., Plastics Division.

MAPROFIX TLS 50

Triethanolamine salt of a sulfated fatty alcohol mixture, principally triethanolamine lauryl sulfate. A light amber liquid, 40% active; miscible with water and alcohol, compatible with dilute acids and alkalies. Use: Foaming and emulsifying agent; excellent detergent for commercial and industrial cleaners; in shampoos and other cosmetics. Commercially available. Onyx Oil & Chemical Co.

MET-L-X DRY POWER

A special extinguishing agent used in Ansul Met-L-X Dry Powder Extinguishers for safe application to metal fires. Use: Effective on fires involving magnesium, sodium, potassium, zinc, and other metals. Ansul Chemical Co.

MH-30

A water soluble liquid containing 30% by weight maleic hydrazide as the diethanolamine salt. Contains three pounds of maleic hydrazide per gallon. Weight: ten pounds net per gallon. Available for test sales for experimental use only. Limited by law to sales to organizations with qualified technical personnel to adequately test and report upon results at season's end. Suggested uses: To improve storage stability of onions and carrots by prevention of sprouting in storage; to delay blossoming of raspberries; to control wild onions, witch grass, and Johnson grass. Naugatuck Chemical Division, U. S. Rubber Co.

MICHELENE 545

Pale, white, viscous liquid with a pleasant odor; compatible with urea formaldehyde resins. Use: As an after-treating agent to improve wash-and-light fastness of a select group of direct dyes on cotton or viscose. Pilot-plant availability. M. Michel & Co., Inc.

NEUFUME DMX

A composition, available in liquid and paste form. Use: Offers durable gas-fading protection for acetate dyes. Commercially available. Onyx Oil & Chemical Co.

NIAGARA FAST COPPER BLUE EG

This product is a non-dusting, direct dye for cotton or rayon. It produces moderately bright, reddish blue shades which, on after-treatment with copper, become considerably greener in shade; they also acquire considerably better fastness in many other respects, which is particularly noticeable on rayon, such dyeings exhibiting very good fastness to hot pressings, rubbing and light and excellent fastness to acids, alkalies, water, sea water and perspiration and discharging to a good white, all of which render it particularly valuable for coloring snow and ski suits. National Aniline Division, Allied Chemical & Dye Corp.

NINOL 1281

A nonionic detergent of the amine condensate type that has been developed specifically for blending with liquid scrub soaps to produce "Synsoap" cleaners with high viscosity and rinsibility. NINOL 1281 does not interfere with soap foam. Use: To formulate viscous all-synthetic liquid cleaners that will not rust steel drums. Available in any quantity. Ninol Laboratories.

NINOL 2012A

A nonionic detergent of the amine condensate type having exceptional thickening power for other synthetics. Use: Added to alcohol sulfate shampoos or alkyl aryl sulfonate solutions it greatly increases viscosity, and also imparts rust inhibition. Available in commercial quantities. Ninol Laboratories.

NOPCO 1067-A

An anionic surface active agent which exhibits 200% better wetting and spreading in acid media as compared with alkaline or neutral systems. The amber liquid gives instantaneous wetting at 0.5% in 5% sulfuric acid as compared with 13.8 seconds at 0.5% in tap water. pH of product itself in dilute solution 7.0. Use: In metal working operations such as pickling, anodizing, and phosphatizing. Commercially available. Nopco Chemcial Company.

ONYXOL 336

An alkanololamine condensate-non-ionic possessing excellent detergent, foaming, dispersing and wetting out properties. Use: In the compounding of industrial and home cleaners, shampoos, polishes and dispersion of pigments. Commercially available. Onyx Oil & Chemical Co.

ONYX BTC-471

A technical grade substituted benzalkonium chloride. High molecular weight quaternary ammonium germicide. Phenol coefficients at 20°C. (F.D.A. Method Bull. #198) *S.aureus* 291 and *S.typhosa* 218; 50% aqueous solution; cationic surface-active; light yellow; viscous; odorless; non-toxic and non-irritating at use dilutions; Sp.G. 0.97 at 25°C. Compatible with non-ionic and cationic surface-active agents. Use: As a germicide, fungicide, general disinfectant, deodorant and sanitizer. Available in commercial quantities. Onyx Oil & Chemical Co.

ONYX BTC-927

A technical grade substituted benzalkonium chloride. High molecular weight quaternary ammonium germicide. Phenol coefficients at 20°C. (F.D.A. Method Bull. #198) *S.aureus* and *S.typhosa* 275; 50% aqueous solution; cationic surface-active; light yellow; viscous; odorless; non-toxic and non-irritating at use dilutions; Sp.G. 0.97 at 25° C. Compatible with non-ionic and cationic surface-active agents. Use: As a germicide, fungicide, general disinfectant, deodorant and sanitizer. Available in commercial quantities. Onyx Oil & Chemical Co.

PC-1WW

Clear, bright, low viscosity liquid, free from moisture and suspended matter. Composition approximates methyl octadecadienoate. Avg. M.W. 295; Density 7 45 lb./gal. @ 25° C.; Color (Gardner) 1; Viscosity (G.H.) A2 @ 25°C.; Acid Value 25; Iodine Value 145; Sap. Value 193. Suggested uses: Fatty component for manufacture of alkyd resins. Available in commercial quantities. The Baker Castor Oil Co.

PENCHLOR FCC CEMENT

A fast setting silica type cement. Use: With steel gridwork to overcome erosion caused by fine solids carried in hot or warm gas or air streams. When applied with steel gridwork forms linings about ¾ inch thick, which helps prevent graphitization, erosion and some corrosion of the supporting metallic structure. Resistant to most acids and hardens by chemical setting action to a touch and durable surface. Available in commercial quantities. Pennsylvania Salt Manufacturing Co.

PENNSALT C.A.F.

Pale blue free flowing powder. Forms copper ammonium fluoride complex when dissolved in water. Solubility in water, 20% by weight. Bulk density, 76.3 pounds per cubic foot. Contains 5.1% copper by weight. Cloth to be mildew proofed—dipped in one percent copper solution at room temperature then dried to leave an insoluble salt in the cloth. Woods to be treated for termite control can be soaked in 0.5% copper solution by either painting, spraying, or dipping. Pressure impregnation may also be used. Use: Mildew proofing, rot proofing and termite control of woods, and as a dye fixative. Available in pilot-plant quantities. Pennsylvania Salt Manufacturing Co.

PENNSALT SR-4

A black, powdered material which is soluble in water and muriatic acid; sharp HCl-like odor; bulk density 30 lbs./cu. ft.; stable but hygroscopic. Use: To remove scale from ferrous forgings and replaces descaling by pickling or mechanical means. Scaled forgings are dipped into room temperature SR-4 bath, heat treated in oxidizing atmosphere furnace, quenched in water or oil and emerge scale free. Commercially avaiable. Pennsylvania Salt Manufacturing Co.

PENNSALT SOLUBILIZING CLEANERS

Liquid cleaners containing surface-active agents, soaps, and other materials in a solvent. Four SC Cleaners are available. They are clear liquids ranging in color from pale yellow to dark cherry red. Through the principles of solubilization the cleaners readily remove such soils as buffing compound, drawing lubricants, rust preventatives, and others. Uses: For ferrous and non-ferrous metals. SC-3 may be used as a hand cleaner for the removal of pigments and dyes. Four SC Cleaners are available. Clear liquid ranging in color from pale yellow to dark cherry red. Available in pilot-plant quantities. Pennsylvania Salt Manufacturing Co.

PERICLASE MIX, REFRACTORY (Permanente 165 PERICLASE Ramming and Patching Mix)

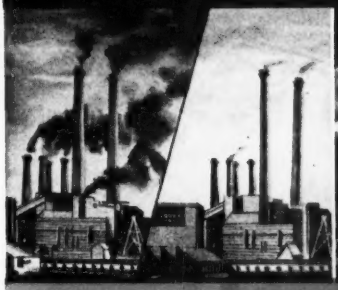
MgO. Bulk Density (rammed, burned) 170-175 lbs./cu. ft., M.P. over 3650°F (Pyrometric Cone Equiv. over 42); color, yellow-green. Properties: Crystalline magnesia parteiles form hydraulic setting mix with water (rather than air-setting). Use: Can be rammed in place and burned to form 94-95% MgO (including bond) lining without harmful fluid formation. Results in highly refractory, strong, dense, crystalline PERICLASE refractory lining for basic furnaces subject to high temperature and alkaline corrosion. Available in commercial quantities. Chemical Division, Kaiser Aluminum & Chemical Sales, Inc.

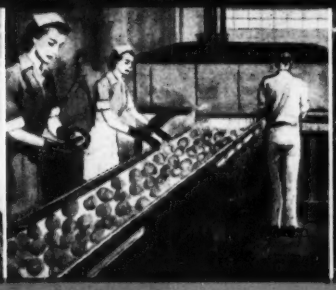
ORONITE CHEMICAL COMPANY

THE NAME TO WATCH IN CHEMICALS

D-40
is more than a detergent

The detergent base of many industrial and household cleaning compounds, Oronite D-40 has dozens of other uses. Its versatility and high quality are characteristic of the chemicals made by Oronite—a dependable source of basic ingredients for better products.





THREE TYPICAL INDUSTRIAL USES OF ORONITE D-40:

1 SMOG REDUCTION

Use of D-40 in smog control systems, removes hydrocarbons from stack gasses and prevents the formation of undesirable emulsions in the "scrubbing" solution. In actual practice this process has reduced exhaust smoke by as much as 90%, which offers a potential control of smog conditions in industrial areas.

2 AGRICULTURE

In addition to its value in washing many fruits and vegetables, Oronite D-40 is a tremendous aid in peeling these foods during canning and packing operations. Two distinct advantages are obtained; 1) immersion time and the concentration of alkali can be reduced and 2) the fruits and vegetables retain better color.

3 CEMENT

The use of Oronite D-40 in the production of cement products, such as building blocks, provides many distinct advantages. The texture of the finished product is improved, water requirements reduced, plasticity and workability are better and "stripping" from molds or forms is facilitated. In addition, the abrasive wear on mixing equipment is greatly reduced. All these contributions help cut production costs.

A partial list of other Oronite Chemicals

NOTICE
Some of the following are currently in short supply.

Detergent Alkane	Gas Odorants	Ortho Xylene
Detergent Slurry	Polybutenes	Para Xylene
Detergent D-60	Sodium Sulfonates	Xylol
Wetting Agents	Purified Sulfonate	Aliphatic Acid
Lubricating Oil Additives	Naphthenic Acids	Hydroformer Catalyst
Cresylic Acids	Phthalic Anhydride	

If you want more detailed information about D-40 or other Oronite Surface Active Agents, just write us and we'll be glad to send it to you.

ORONITE CHEMICAL COMPANY

38 SANSOME ST., SAN FRANCISCO 4, CALIF. STANDARD OIL BLDG., LOS ANGELES 15, CALIF.
30 ROCKEFELLER PLAZA, NEW YORK 20, N.Y. 600 S. MICHIGAN AVENUE, CHICAGO 5, ILL.
MERCANTILE SECURITIES BLDG., DALLAS, TEXAS

2207

Even in Sub-zero Weather...

COLUMBIA-SOUTHERN CAUSTIC CARS HELP INSURE EASY UN-LOADING WITHOUT STEAMING!

During the transportation delays of the past winter, a car of liquid caustic soda was shipped January 25 from Columbia-Southern's Natrium, West Virginia, plant . . . arrived Chicago January 30 . . . spotted February 9 . . . unloaded February 12 *without the use of steam, and with a full line within a minute.*

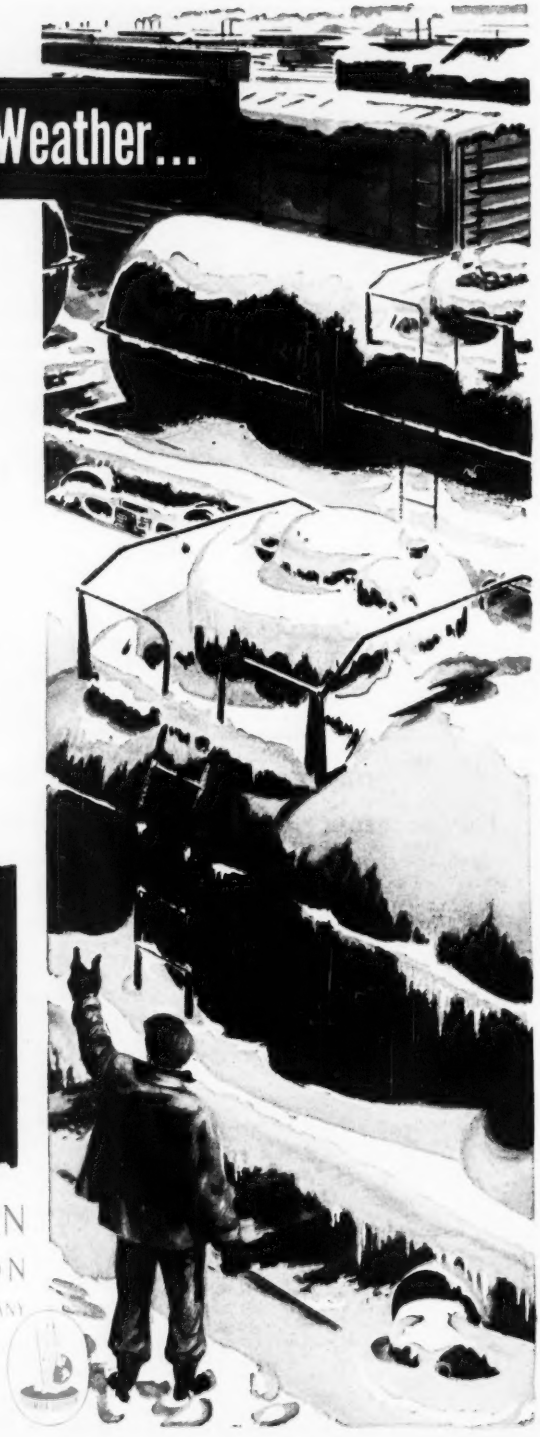
During this nineteen day period the car was in transit, outside temperatures were mostly below freezing, twice reaching as low as 15 degrees below zero! Yet easy unloading was assured by the efficiency of the Columbia-Southern designed car.

The Columbia-Southern caustic tank car is one of the many valuable contributions to industry made by Columbia-Southern, pioneer in better transportation and handling of liquid caustic soda.

Columbia-Southern's policy is not only to make the highest grade caustic soda, but to ship it with caution and care to you.

Among the tank car features pioneered by Columbia-Southern are:

the patented tank car lining which permits delivery of liquid caustic soda without metallic pick-up—in any concentration • the fusion welding which eliminates rivets as a possible source of leaks • increased tank car insulation • greatly improved heating equipment • and numerous other unloading and safety improvements.



COLUMBIA-SOUTHERN
CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY

EXECUTIVE OFFICES:
FIFTH AVENUE AT BELLEFIELD • PITTSBURGH 13, PA.

DISTRICT OFFICES: BOSTON • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • HOUSTON • MINNEAPOLIS • NEW ORLEANS • NEW YORK • PHILADELPHIA • ST. LOUIS

PERMUTIT H 70

A high capacity carboxylic acid type cation exchange resin; bead form—particle size 90% —16 mesh + 50 mesh; color, off-white; capacity, up to 85 kilograins per cubic foot. Use: For sodium exchange and for hydrogen exchange at pH above 4; preferentially retains multivalent cations. The Permutit Co.

PERMUTIT S

A highly basic anion exchange resin of the quaternary ammonium type; bead form—particle size 90%—16 mesh + 50 mesh; color, pale yellow; capacity, total capacity for acid removal up to 25 kilograins per cubic foot (as $CaCO_3$), neutral salt splitting capacity up to 15 kilograins per cubic foot (as $CaCO_3$). Use: For the removal of weak acids from solutions, for splitting natural salts; for anion exchange; for silica removal from water; for mixed bed demineralizing. The Permutit Co.

PHYGON NAUGETS

A seed protectant in nugget form containing 50% 2,3-dichloro-1, 4-naphthoquinone as the active ingredient. Easily suspended in water for slurry method of seed treatment application only. For use on alfalfa and small seed legumes, beets, corn, peas, pepper, rice, spinach, and other seeds. Naugatuck Chemical Division, U. S. Rubber Co.

PIGMENTAR 20

A pine tar extender derived from pine tree products. Use: As a supplement to extend pine tar supplies during short periods of actual pine tar shortage. Usage up to 50% is suggested. Available in tank cars and drums. Glidden Co.

PLASTICIZER C-311

An ester type plasticizer and softener. Clear, oily liquid, yellow color, miscible with most organic solvents. Sp. Grav. approximately 0.890 @ 20°C. Insoluble in water. Weight 7.45 lbs. per gallon. Uses: Primary plasticizer for nitrocellulose, ethyl cellulose, chlorinated rubber, polystyrene. Secondary plasticizer for vinyl resins. Imparts good hand, low water extraction, excellent flexibility. Good wetting agent and grinding aid for colors and pigments. Excellent low temperature plasticizer for Perbunan and Paracril type rubbers. Available in commercial quantities. C. P. Hall Co.

PLASTICIZER C-325

An ester type plasticizer and softener. Clear, oily liquid, amber color, fatty odor, Specific Gravity approximately 0.887 @ 25°C. Insoluble in water, miscible with most organic solvents, weight 7.3 lbs. per gallon. Uses: Primary plasticizer and softener for most cellulose esters, chlorinated rubber, polystyrene, etc. Secondary plasticizer for vinyl resins. Imparts good hand, low water extraction, excellent flexibility. Good wetting agent and grinding aid for colors and pigments. Excellent low temperature plasticizer for Perbunan and Paracril type rubbers. Available in commercial quantities. C. P. Hall Co.

PLURONIC F68

Flake nonionic surface active agent. 100% active. Unusually high molecular weight with unique hydrophobic unit. Properties intermediate between surfactants and natural organic colloids and synthetic polymers. Free-flowing white flakes, melting point 51°C. minimum, pH of 2.5% solution between 6 and 8. Water-soluble, low odor, and low foaming. Extremely low toxicity. Taste slightly bitter but easily masked. Relatively non-hygroscopic. Highly soluble in aromatic and chlorinated hydrocarbons and ethanol. Insoluble in aliphatic hydrocarbons and vegetable oils. Very stable to acids, alkalies and electrolytes. Marked synergistic effect in detergents. Uses: Detergent, Emulsifier, Wetting Agent, Cleanser Formulations. Plasticizer. Dust Laying Agent. Lubricant Additive. Uses in textile, paper, cosmetics, detergent, insecticides, petroleum, printing, plastics, laundry and cleaning industries. Availability: Semi-Commercial. Wyandotte Chemicals Corp.

PLURONIC L44

Nonionic surface active agent. 100% active. High molecular weight with unique hydrophobic unit. Sp. Gr. 1.062 at 25/25° C., Viscosity 350-800 cps. at 25°C., Pour Point 12°C., pH of 2.5% solution between 6 and 8. Oily liquid, non-volatile, completely water-soluble, low odor, low foaming. Relatively non-toxic and non-hygroscopic. Highly soluble in aromatic and chlorinated hydrocarbons and ethanol. Insoluble in aliphatic hydrocarbons and vegetable oils. Very stable to acids, alkalies and electrolytes. Uses: Detergent, Emulsifier, Wetting Agent, Cleanser Formulations. Plasticizer. Lubricant Additive. Uses in textile, paper, metal cleaning, cosmetics, insecticide, petroleum, and plastics industries. Availability: Semi-Commercial. Wyandotte Chemicals Co.

PLURONIC L62

Nonionic surface active agent. 100% active. High molecular weight with unique hydrophobic unit. Sp. Gr. 1.037 at 25/25°C., Viscosity 200-500 cps. at 25°C., Pour Point 11°C., pH of 2.5% solution between 6 and 8. Water solubility: Cloudy solutions between 0.5 and 15%. Clear solutions all other concentrations. Oily liquid, non-volatile, low odor, extremely low foaming. Relatively non-toxic and non-hygroscopic. Highly soluble in aromatic and chlorinated hydrocarbons and ethanol. Insoluble in aliphatic hydrocarbons and vegetable oils. Very stable to acids, alkalies and electrolytes. Uses: Detergent, Emulsifier, Wetting Agent, Cleanser Formulations. Plasticizer. Lubricant Additive. Uses in textile, paper, detergent, plastics, petroleum, insecticide and cosmetic industries and in mechanical dishwashing. Availability: Semi-Commercial. Wyandotte Chemicals Co.

PLURONIC L64

Nonionic surface active agent. 100% active. High molecular weight with unique hydrophobic unit. Sp. Gr. 1.066 at 25/25° C., Viscosity 450-800 cps. at 25°C., Pour Point 21°C., pH of 2.5% solution between 6 and 8. Oily liquid, non-volatile, completely water-soluble, low odor, low foaming. Relatively non-toxic and non-hygroscopic. Highly soluble in aromatic and chlorinated hydrocarbons and ethanol. Insoluble in aliphatic hydrocarbons and vegetable oils. Very stable to acids, alkalies and electrolytes. Uses: Detergent, Emulsifier, Wetting Agent, Cleanser Formulations. Plasticizer, Lubricant Additive. Uses in textile, paper, detergent, petroleum, and plastics industries. Availability: Semi-Commercial. Wyandotte Chemicals Co.

POLYAMIDE RESIN #90s

A copolymerized polyamide made by the copolymerization of di-and tri-linoleic acids and other acids with ethylene diamine. The resin has been heat stabilized by the addition of a small amount of antioxidant. S.P., 173°C. minimum; hardness, 21; color, amber; acid number, 15 maximum; Sp. G., .966; ash, .10% maximum. Use: Provides water, water vapor and grease resistant coatings for paper and other surfaces, serves as a coating for electrical and metal parts and acts as a binder in specialty molding. Available in commercial quantities. General Mills, Inc.

POLYAMIDE RESIN #100s

A plasticizing type of resin made by the condensation of a mixture of dimerized and trimerized unsaturated vegetable oil fatty acids with diethylene triamine and heat stabilized by the addition of a small amount of antioxidant. S.P., 43°C. minimum; color, amber; acid number, 12 maximum; Sp. G., .987; ash, .10% maximum; av. mol. wt., 3000-6500. Use: As a plasticizer and tackifier for other resins and as a water and grease resistant adhesive. Available in commercial quantities. General Mills, Inc.

POLYCO 296 N

Synthetic acrylic thickener and protective colloid. Use: Small concentrations highly effective in maintaining viscosity, shelf life, and aiding brush out of latex paints. Data Sheet P-27. American Polymer Corp.

POLYCO 309

A polyvinyl acetate pilymerized in alcohol. Use: to coat paper and boxes imparting grease and oil resistances. Cardboard coated with 309 is used extensively for the packaging of doughnuts and cakes preventing oil spots on the external surface and also acting as a heat seal coating. Described in brochure P-15. American Polymer Corp.

POLYCO 319

Acrylic copolymer emulsion. Outstanding properties are: Permanent flexibility, high plating temperatures, good low temperature flexibility and formation of bright, continuous films which are water repellent. Described in data sheet P-4. Use: As a pigment binder and sealer in the leather industry. American Polymer Corp.

POLYCO 350 N

A butadiene-styrene latex used as a pigment and clay binder in the paper industry. It is specifically polymerized for combining with pigments thickeners which would normally coagulate soap—stabilized latices. Technical Data Sheet P-11 describes it. Use: As a pigment and clay binder in the paper industry. American Polymer Corp.

POLYCOS 422 AND 423-NS

40% aqueous emulsions of butadiene-acrylic copolymer. POLYCO 423 deposits tough, flexible film of medium softness. POLYCO 422 deposits slightly harder film. Intermediate film properties obtained by blending. POLYCO 422 pH 8-10; POLYCO 423 pH 6-8. Viscosity both grades approximately 30 cps. Use: For pigment binding in leather finishes, paper saturants, and coatings. Available in commercial quantities. Technical Bulletin P-23. American Polymer Corp.

POLYCOS 434 AND 435

40% aqueous emulsion of polycrylic ester copolymers. POLYCO 435 is a soft, tacky grade; POLYCO 434 is medium-hard grade. Can be blended for intermediate film properties. Deposit clear, water resistant films with excellent low temperature flexibility, permanent tack, excellent ageing and light resistance, and excellent adhesion to wide variety of surfaces. pH 4-6, Viscosity 10-25 cps. Use: As adhesive base, binder for leather scrap, pigment binder on surface coatings and masking tape adhesives. pH 4-6, viscosity 10-25 cps. Available in commercial quantities. Technical Bulletin P-28. American Polymer Corp.

POLYCO 437—POLYACRYLIC ACID

A 25% solution of polyacrylic acid in water. Viscosity 1000-2000 cps. Excellent affinity for nylon. Easily removed by scouring. Use 0.2-3% on yarn weight for tricot knitting and 1-2% for weaving. Markedly reduces seconds and rejects in mill operations. Use. For warp sizing of nylon and other synthetic fiber. Available in commercial quantities. Technical Bulletin P-31. American Polymer Corp.

POLYCO 446—ACRYLIC—VINYL CHLORIDE COPOLYMER EMULSION

A 45% aqueous emulsion of an internally plasticized polyvinyl chloride copolymer. Deposits clear, continuous, permanently flexible film, which exhibits excellent grease, water and moisture vapor resistance. Shows excellent adhesive characteristics to a multitude of hard-to-adhere surfaces. Use: For heat seal coatings on vinyl film, paper and fabric; leather finishing; grease and water-resistant coatings; water-based printing inks for vinyl film. Viscosity 10-20 cps. pH 3-5. Commercially available. Technical Bulletin P-32. American Polymer Corp.

POLYCO 1010-32—ACRYLIC COPOLYMER EMULSION

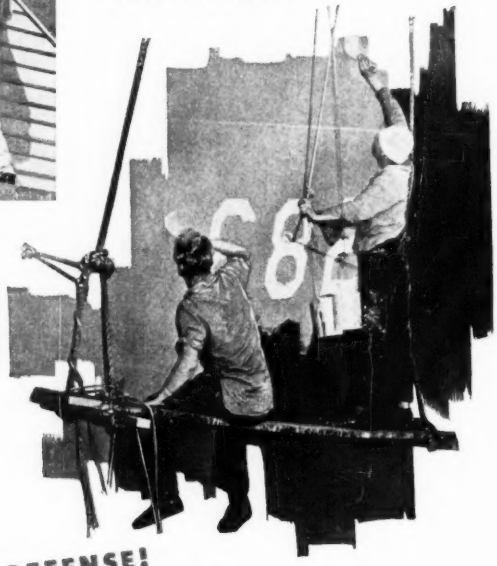
A 40% solids unplasticized acrylic ester copolymer emulsion. Deposits very soft, flexible, continuous film with excellent ageing characteristics and low temperature flexibility. Stable over wide pH range of 3-11. Furnished at pH 4-6 and viscosity 20-30 cps. Use: Recommended particularly for leather finishing. Can be used in compounding adhesives and as a softener for harder acrylic resins such as POLYCO 319 and POLYCO 423. Commercially available. American Polymer Corp.

POLYCO 1040-14B—VINYL ACETATE CO-POLYMER EMULSION

A 55% solids polyvinyl acetate emulsion distinguished from other commercially available grades by its fine particle size, glossy film, and water-resistant film characteristics. Formulated to be easily compatible with multitude of commonly used compounding ingredients including

GLYCERINE

IMPORTANT FOR PROTECTIVE COATINGS...



...IMPERATIVE FOR NATIONAL DEFENSE!

Why do so many top-quality coatings rely on Glycerine-derived alkyd resins or ester gums? These versatile components add film toughness . . . long life . . . and improved color retention to paints and varnishes. Special finishes depend on them, too. Corrosion-inhibitors, de-icing paints, anti-rust compounds, grease-proof coatings – all take advantage of Glycerine's outstanding range of properties!

Today, Glycerine is in strong national demand. Especially for coatings that must meet military specifications. So if you find supplies temporarily short, here's why: Glycerine's outstanding versatility is answering both civilian and defense coating problems at the same time!

GLYCERINE PRODUCERS' ASSOCIATION
295 Madison Ave., New York 17, N. Y.

plasticizers, solvents, thickeners, gums, starches, dextrines and clays. Viscosity 1000-1500 cps., pH 4-5. Use: Excellent base for compounding waterproof adhesives, grease proof coatings, and heat seal coatings. Commercially available. Technical Bulletin P-16. American Polymer Corp.

POYLCO 1677-35C—ACRYLIC COPOLYMER EMULSION

A 40% aqueous emulsion of a polyacrylic ester copolymer. Unplasticized. Deposits continuous, tough, flexible glossy film having excellent ageing characteristics and grease resistance. Stable over a wide pH range of 3 to 11. Furnished at pH of 4-6 and viscosity of 50-100 cps. Use: Grease proof coatings, heat seal coatings, combining adhesive, as a base for plastic floor waxes. Commercially available. Technical Bulletin P-25. American Polymer Corp.

POLYCO 1677-7C—ACRYLIC COPOLYMER EMULSION

A 40% aqueous emulsion of a polyacrylic ester copolymer. Characteristics similar in all respects to POLYCO 1677-35C. Use: Recommended for same uses at 1677-35C and also serves excellently as pigment binder for leather finishing. Commercially available. Technical Bulletin P-25. American Polymer Corp.

POLYCRYLS 413, 414, 427, 415, 419, 420—ACRYLIC COPOLYMER SOLUTIONS

The Polycryl group comprises a series of essentially water white solutions of acrylic copolymers. Available in various grades of film toughness and hardness. Supplied in representative solvents commonly used in protective coatings industries. Suggested applications: Hardening and increasing gloss of vinyl solutions; preparation of heat-resistant white enamels; preparation of gasproof enamels, fabric coatings and clear or pigmented protective finishes. Glossy, transparent films are deposited from all grades which possess excellent heat and light stability combined with low pigment reactivity and resistance to water, alkalies, acids and alcohols. Commercially available. Technical Bulletin P-26. American Polymer Corp.

POLYMER C-3

Water white granular resin. S.G. ca. 1.2 @ 20°C./20°C., tensile strength—ca. 5200 p.s.i. A modified vinyl acetate resin which can be made water soluble or dispersible by treatment with dilute organic or inorganic bases. While normally water insoluble, it requires only a small amount of alkali or ammonia to make it water soluble. Uses: For leather coating; hot melts; as adhesives; as thickening agent and emulsifier for resin dispersions. Commercially available. Shawinigan Products Corp.

POLYSIZE RESIN EMULSIONS

A series of synthetic resins based on high molecular weight derivatives of polymerized monomers. Use: Permanent starching of cotton, bodying, dulling, weighting, stiffening (nylon, rayon, cotton and silk), snag-resistant finishes and binder for fillers. American Polymer Corp.

POLYVINYL ACETATE EMULSION TS22

55% solids; pH 3.5 to 5.5; emulsion viscosity—1-3 poises. A new polyvinyl acetate dispersion, free-filming, which forms an irreversible coating. Excellent compounding stability. Use: Compatible with dyes and pigments; useful in adhesives. Commercially available. Shawinigan Products Corp.

PROTOVAC CASEIN PV-20

A neutral sodium caseinate, easily dispersed without alkali; disperses at 150°F.; dispersion pH 7.0 (5 of water to 1); good film clarity. Use: In paper coating, textile sizing, cosmetics, and pharmaceuticals. Commercially available. The Borden Co., Chemical Division.

PROTOVAC CASEIN PV-412

A modified casein characterized by solubility in mixed alcohol-water or ketone-water solvents without heat. pH of dispersion 7.0-7.4 (3 or water to 1); films dry rapidly and are of excellent water resistance. Uses: printing ink vehicles, shoe finishes, overcoating, can labeling. Commercially available. The Borden Co., Chemical Division.

PROTOVAC CASEIN PV-8397

A unique caseinate, soluble with or without alkali to produce high or low viscosity dispersions; dispersion pH 6.6 without alkali (5 of water to 1), 9.6 with amminia (5 of water to 1); film clarity good; excellent emulsifying agent. Use: In binders and pigment finishes, floor waxes, sealers. Commercially available. The Borden Co., Chemical Division.

PROTOVAC CASEIN PV-8894

A modified casein characterized by excellent clarity of solution and films. May be dispersed at or near pH 7 or on extreme acid side; excellent emulsifying agent. Use: In leather and shoe finishes, clear coatings, photolithographic binder, acidic dispersions, pharmaceuticals. Commercially available. The Borden Co., Chemical Division.

PROTOVAC CASEIN PV-8979

A zinc caseinate, easily dispersed, requires no alkali; dispersion pH 7.4 (5 of water to 1); dispersion stability excellent; good formaldehyde tolerance; film of very good water resistance and good clarity; excellent emulsifying agent. Use: In leather and shoe finishes, emulsion paints, paper coatings, sizes and sealers. Commercially available. The Borden Co., Chemical Division.

REINFORCING RESIN EMULSION 1073-18B

Reinforcing Resin Emulsion 1073-18B, imparts adhesion to cured rubber surfaces, reduces costs and increases tensile strength of cured and uncured latex films. 10-50 parts dry ARRCCO 1073-18B are being used per 100 parts dry rubber depending on end use requirements. Use: As an addend for natural GRS and neoprene rubber latices in compounds for curled hairs, foam rubber, industrial adhesives and coatings. American Resinous Chemicals Corp.

RELEASE AGENT, SILICONE EMULSION

A solvent free, water dilutable emulsion of Dow Corning 7 Compound. Easily applied by spraying or dipping. Use: It gives clean easy release of shell molds; reduces build-up; improves finish; helps to maintain close tolerances. Noncorrosive, nonflammable; effective at low concentrations. Commercially available. Dow Corning Corp.

REZ EXTERIOR WOOD FINISHES

Supplied in four colors: Driftwood Rez, Sage Rez, Mahogany Rez, Cedar Rez. The new color-toned sealers are companion products for Redwood Rez. Use: Penetrating sealers for exterior use on new wood siding, sash, doors, fences, garden furniture. Provides an easy-to-use, two-coat system for exterior finishing. Penetrates and seals wood, colors the surface without hiding the grain pattern. Does not build up a heavy film which might be subject to blistering, cracking or peeling. Recommended also for interior finishing; color-tones and seals new panelling woodwork, cabinets in *one* application. Monsanto Chemical Co., Western Division.

S/V HEAT TRANSFER OIL LIGHT

An aromatic pertoleum product; Specific Gravity 60/60, 1.0; Pour Point, below 0°F.; Viscosity at 100°F, 37 Saybolt Seconds. Use: As a non-corrosive heat transfer medium to replace water solutions in heating systems installed to control ice and snow. Commercially available. Socony-Vacuum Oil Co., Inc.

S/V SOVALOID C

A synthetic product made by the chemical rearrangement of petroleum hydrocarbons. It is composed entirely of polycyclic aromatic hydrocarbons, in which three- and four-ring compounds predominate; Specific Gravity 60/60, 1.05; viscosity at 100°F, 82 Saybolt Seconds; Pour, -25°F; Mixed Aniline Cloud Point, 69°F; Initial Boiling Point, 598°F; Final Boiling Point, 723°F. Use: As replacement, in whole or in part, for the expensive plasticizers used in nitrile rubber compounds and in vinyl resin compounds and plastisols. It is completely compatible with vinyl resins. Commercially available. Socony-Vacuum Oil Co., Inc.

S/V SOVASPRAY 100

An isoparaffinic oil with very little phytotoxicity but considerable insecticidal and ovicidal efficiency; Specific Gravity 60/60, 0.78; viscosity at 100°F, 33 Saybolt Seconds; Aniline Point, 194.7°F; Unsulfonated Residue, 97%; Acid Number, 0.04; Initial Boiling Point, 384°F; Final Boiling Point, 502°F. Suggested uses: insecticide and ovicide, for use alone or in combination with other insecticides, where damage to plants must be held to a minimum; carrier for oil soluble fungicides. Availability: small quantities for experimental purposes. Socony-Vacuum Oil Co., Inc.

SANTOLENE F

Dosage of .01 to .03% proved highly effective. Dark brown oily liquid. Weight 8.2 lbs. per gallon. Use: Sludge inhibitor for distillate fuel oils. Available in commerical quantities. Monsanto Chemical Co.

SANTOLUBE 70

Recommended dosage in the range of .02 to .05%. Dark amber liquid. Weight, 7.7 lbs. per gallon. Use: Rust inhibitor for turbine, hydraulic, and simular oil applications. Availability, commercial quantities. Monsanto Chemical Co.

SILICA GEL, CHROMATOGRAPHIC

1—Silica gel—Grade 923, 99.7% SiO_2. Less than 0.02% Fe_2O_3. Particle Size: 60-200 mesh. Shows satisfactory resolution of hydrocarbons according to ASTM procedure D 936-47T. Use: For chromalographic separations of hydrocarbons and steroids. Commercially available. The Davison Chemical Corp.

SILICA GEL, CHROMATOGRAPHIC

Grade 979—Finely divided, extremely pure silica. Thru 325 mesh (0 to 20 microns). Average particle size 2 microns (weight basis). Mean particle diameter less than 0.5 microns. 99.6% SiO_2. Less than 0.02% Fe_2O_3. Use: For chromatographic separation of hydrocarbons and steroids. Commercially available. The Davison Chemical Corp.

SILICONE RUBBER COMPOUND, G-E 81223

Outstanding for its ease in processing. Has excellent molding and extrusion properties after five-minute warm up. High hot tear strength permits molding of parts with undercuts, and being neutral in color, stock can be colored for product identification purposes. Temperature range 550 F to -85 F, high tensile strength, high elongation, and excellent electrical properties. Use: Diaphragms, belting, hose, mountings, sleeves. Chemical Division. General Electric Co.

SOLANTINE BLUE 3GL

A non-dusting, direct blue, producing, on cotton or rayon, moderately bright blue shades of very good fastness to light and fair fastness to washing. An after treatment with National Naccufix alone increases the wash fastness while maintaining good light fastness. After treatment with urea-formaldehyde and National Naccufix also increases the wash fastness with but slight decrease in light fastness. National Solantine Blue 3GL yields very good unions on cotton-rayon materials and leaves acetate effects unstained. It discharges well with either neutral or alkaline pastes. National Aniline Division, Allied Chemical & Dye Corp.

SOLANTINE ORANGE 5GC

This is a very level dyeing direct dye producing, on cotton or rayon, rather bright, yellowish orange shades of good fastness to light—very good when dyed on rayon; very good fastness to cold water and excellent fastness to alkalies, mercerizing and rubbing. It dyes well in hard water (8 degrees hardness), yields excellent unions on cotton-rayon materials leaving acetate rayon effects practically unstained. It is not suitable for discharge. National Aniline Division, Allied Chemical & Dye Corp.

SOLKA-FLOC

A finely divided purified alpha cellulose fibre, manufactured in a range of controlled finenesses. Use: For conversion to cellulose derivatives, in welding rod coatings, as a process-

ing aid in rubber compounds, as filler in plastics, and as filter aid. Commercially available. Brown Co.

SOLRICIN 2

A paste consisting of an 85% aqueous solution of ammonium ricinoleate. Sp. Gr. 97. Uses: greases; anti-corrosive agent; emulsifier. Available in commercial quantities. The Baker Castor Oil Co.

SOLVAROM

Sp. G. 0.9998; R. I. 1.5011 @ 20C.; Boiling Range 313-326 C. Water-white to colorless polyoxy aromatic ether. Odor, mild pleasant initial odor; no residual odor. Chemical properties: Stable in alkali and most acids; soluble in all proportions in essential oils and mineral oil; clearly soluble in 1% volumes of 70% alcohol. Uses: solvent for all crystalline organic chemicals, gums and resins; particularly useful in soap formulations. Availability: commercial quantities. Dodge & Olcott, Inc.

SOLVENT 301

Alcohol content, min. 99%; Sp. G., .805 20°/4°c (appx.); Flash point (Tagopen cup) 95°F min.; evaporation rate (Butyl Acetate-1.0) 1.3; Boiling Range 97-100°c (760 mm); sol. in water, complete; odor, like n-propanol, color water white. Celanese Solvent 301 is a blend of normal propyl alcohol and secondary butyl alcohol. Suggested use: In lacquers and thinners to replace more costly alcohols such as sec-butanol, ethanol/butanol or isobutyl carbinol Zisopropanol mixtures, solvent for S.A.E. moderate duty brake fluids. Blended to offer the advantages of both n-propanol and sec-butanol. Commercially available. Celanese Corp. of America, Chemical Division.

SOLVENT 901

Sp. G., .837,20°/4°c (appx.); Flash point (Tagopen Cup) 115°F. min.; evaporation rate (Butyl acetate=1.0)0.3; boiling range 125-155°c; Sol. in water @ 25°c 1.4% by wt.; odor, typical high alcohol; color, water white. Celanese Solvent 901 is a high solvency, alcohol-type solvent intended to compete with butanol and higher alcohols. It contains 75-80% primary 5- and 6- carbon alcohols and 10-15% 6- and 7- carbon ketones. Use: As the sole high-boiling alcohol component of lacquers, thinners, and other coating formulations. It is especially recommended for control of blush resistance and flow. Commercially available. Celanese Corp. of America, Chemical Division.

SPECIAL WHEAT PROTEIN, LIQUID

A syrup-like product, approximately 50% solids, having 55 poise viscosity. Product is stable and can be used to replace powdered casein, soy proteins, etc. Saves time since it is provided in dispersion form. Use: Industrial adhesives, stabilizer for latices and aqueous resin dispersions. End use: Latex water base paints, starch latex paper coatings, leather finishes, emulsion adhesives, and special paper saturants. Available in pilot-plant quantities. General Mills Co.

STABILIZER 54

An organic phosphate derivative supplied as a soft white paste. Use: A light stabilizer for vinyl plastic films and coatings, for application in organosol, latex, and solvent formulations. Available in commercial quantities. Victor Chemical Works.

STA-MINO TYPE B

A highly refined mixture of four essential amino acids (all L- forms). A proximate analysis is as follows: leucine 75%, isoleucine 13%, methionine 8%, phenylalanine 3%. Product is exceptionally low in ash and salt (NaCl). Suggested uses: Formulations of protein hydrolyzates, nutritional supplement and raw material for isolation of individual amino acids. Available in semi-commercial quantities. A. E. Staley Manufacturing Co.

STEROX GF

Straw-colored liquid surface active agent of non-ionic type. Compatible with other non-ionic, an-ionic, or cat-ionic surfactants. Especially suitable for dry detergent mixtures in that it will substantially reduce the dusting during mixing operation and in finished product. Addition of this non-ionic does not affect the detersive action of the dedusted product and it also enhances the lather stability of the dedusted detergent. Physical properties: Not determined. Suggested Uses: Dedusting compound in detergent formulations; emulsifier in herbicidal and insecticidal formulations; emulsifier for metal cleaners; non-ionic for preparation of sanitizing compounds. Available in pilot plant quantities. Monsanto Chemical Co., Phosphate Division.

STEROX TU

Straw-colored liquid surface active agent of non-ionic type; compatible with other non-ionic, an-ionic, or cat-ionic wetting agents. An effective wetting agent supplied in highly concentrated form (90% active) without builder salts. Especially suitable to textile industry where its liquid form facilitates the accurate proportioning of rewetting agents. Viscosity at 25°C., 81.5 centipoises; pour point, 50°F; specific gravity, 1.007 at 25°/15.6°C. Suggested uses: Emulsifier in herbicidal and insecticidal formulations; emulsifier for metal cleaners; incorporation into dishwashing formulations; scouring agent for woolen skeins, rewetting agent in the textile industry, prepasanitizing compounds. Available in pilot plant quantities. Monsanto Chemical Co., Phosphate Division.

STEROX TX

Straw-colored liquid surface active agent of non-ionic type; compatible with other non-ionic, an-ionic, or cat-ionic wetting agents. A fast wetting agent supplied in highly concentrated form (80% active), without builder salts. Especially suitable to textile industry, where its liquid form facilitates the accurate proportioning of rewetting agents. Viscosity at 25°C., 121 centipoises; pour point, minus 15°F.; specific gravity, 1.025. Suggested Uses: Emulsifier in herbicidal and insecticidal formulations, emulsifier for metal cleaners; incorporation into dishwashing formulations, scouring agent for degreasing of woolen skeins, as a rewetting agent in the textile industry, preparation of sanitizing compounds. Available in pilot plant quantities. Monsanto Chemical Co., Phosphate Division.

SUBAL NO. 1

A substitute for egg albumin. It is a white milky aqueous solution, has a neutral pH (ranging from 7.5 to 8.0) and excellent adhesiveness or tackiness. Subal No. 1 freezes at extreme temeratures causing irreversible damage to its keratin protein component. It polymerizes in air to yield a tough, pliable, water resistant film. It displays a remarkable affinity for pigments, and has desirable colloidal suspension properties. Use: In the printing of all types of fabrics (its neutrality as well as its aqueous nature have made it preferred to solvent systems). It also has properties desired by those requiring a permanent size. Available in commercial quantities. Botany Mills, Inc.

SURFACE ACTIVE AGENT BO

Bis(2-butylocty1)sodiumsulfosuccinate. White waxy pellets. Nearly insoluble in water, soluble in most organic solvents. Recommended for preparation of oil-in-water emulsions and solid-in-oil dispersions. Use: In such applications as printing inks, pigment dispersions and textile softeners. Available in trial lot quantities for experimental investigation. American Cyanamid Co.

SURFACE ACTIVE AGENT BPE

Bis(2 - p-tert - butylphenoxyethyl)sodiumsulfo - succinate. White powder. Slightly soluble in water, soluble in most organic solvents. This agent has good wetting power, especially at higher temperatures, high calcium tolerance, and good foaming ability. Use: For dispersion of solids in water, for increasing absorbency of paper products, and as an anti-fogging agent for glass surfaces. Available in trial lot quantities for experimental investigation. American Cyanamid Co.

SURFACE ACTIVE AGENT TR

Bis(tridecyl)sodiumsulfosuccinate. White waxy pellets. Nearly insoluble in water, soluble in most organic solvents. Recommended for preparation of oil-in-water emulsions and solid-in-oil dispersions. Use: In such applications as printing inks and pigment dispersions. Available in trial lot quantities for experimental investigation. American Cyanamid Co.

TERIGTOL* DISPERSANT TD

A polyethylene glycol alkyl ether, 100% active ingredient; Sp. G., 0.999 @ 55°/20°C.; solidification point, 25°C.; Fl. P., 205°F. (Cleveland Open Cup); odorless; opaque, heavily viscous liquid. A non-ionic surface-active agent stable in acids, bases, and salts. Use: As a dispersant and emulsifying agent. Available in research quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

THRIFTEX

A dry-cleannig detergent with exceptional water emulsifying properties composed of non-ionic detergent and an amine fatty acid soap in a petroleum solvent carrier. Thriftex is added to the dry cleaning solvent in the washer either as received or as on emulsion with water. Flash point of the product is 145 F. Use: limited to petroleum solvent systems. Commercially available. Pennsylvania Salt Manufacturing Co.

TICK REPELLENT EXPERIMENTAL 3

Active ingredient, di-n-butyl adipate. Clear yellow liquid, easily dispersed in water. Use: Tests indicate that clothing impregnated with this material effectively repels American Dog Ticks, Lone Star Ticks, and chiggers. Tests also indicate it to be effective on dogs. Available in research quantities for further testing. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

TIPAGON

A non-ionic leveling agent. Use: For dyeing tippy wool. Commercially available. Onyx Oil & Chemical Co.

TOXIMULS

A new series of agricultural emulsifiers with high degree of dispersibility, or spontaneous emulsification when the concentrates are added to water. Stability of the resultant emulsions is excellent in water of all hardness. Use: As emulsifier for DDT, Toxaphene, etc. Full scale scale commercial production is expected this fall. Nimol Laboratories.

UFORMITE 700

Cationic, nitrogenous wet strength resin. Solids content: 30-32% in water; viscosity (Gardner): A-B; pH: 8-9; color: pale straw, clear. Performance characteristics: fast wet strength off-the-machine, ease of mixing, convenient pH control with acid or alum, insensitivity to sulfate iron, adaptability to kraft, sulfite, and rag pulp. Use: Wet strength resin for paper. Available tank-car quantities. Rohm & Haas Co.

VALITE RESIN 1366-M

An acid-catalyzed, semi-thermosetting product of phenol and bagasse, (sugar cane waste cellulosic material); presumably a combination of phenol-furfural, phenol-lignin, phenol-ketone and other phenol-aldehyde resins. Color: blackish-brown to black. Completely soluble in alcohol, acetone and similar solvents. Compatible with conventional phenol-formaldehyde resins. Converts to fast curing thermoset by addition of alkalies such as $Ca(OH)_2$ and additional aldehyde groups such as formalin, hexamethylenetetramine, etc. Use: Can be dissolved in aqueous alkaline solution, then reacted with formaldehyde and put into solution with alcohol to produce an impregnating resin varnish. Serves also as extender resin in molding compounds. Shipped in solid form. Commercially available. Valite Corp.

VICTAWET 14

Formula: $R{\cdot}O{\cdot}PO(OX)_2$. R = alkyl. X = solubilizing group. Molecular weight, about 500. Melting point, below 0° C. Boiling point, decomposes. Specific gravity 1.12 at 25° C. Draves sinking time (0.2%), 30-40 seconds. Yellow liquid, neutral and nonionic, which dissolves in water to form a slightly cloudy solution. Use: Nonionic wetting agent. Available in commercial quantities. Victor Chemical Works.

VICTAWET 34-B

Formula: Sodium salt of an alkyl phosphate. A soft white paste containing about 30% water. Readily soluble in water forming a clear foaming solution. Draves sinking time 15-20 seconds (0.2% soln). Use: Anionic type wetting agent. Available in commercial quantities. Victor Chemical Works.

VINOSOL 1261-32G COATING FOR NYLON

A light weight, low temperature, flexible coating suitable for raincoats and ponchos. This coating is waterproof, abrasion and tear resistant, and meets Military specification MIL-P-3003A Coating for Ponchos. AMERICAN RESINOUS CHEMICALS CORP.

VITAMIN A ACETATE, STABILIZED

Pure synthetic vitamin A acetate embedded in a gelatin matrix to prevent decomposition contains 500,000 U.S.P. units per gram of dry free flowing particles, available in 3 mesh sizes. The light yellow material is essentially odorless and tasteless. Use: In tablets, capsules and other pharmaceutical products where a stable vitamin A is important. Trade Name — "Crystalets". Available in commercial quantities. Chas. Pfizer & Co., Inc.

VITAMIN B_{12} CRYSTALLINE USP

$C_{62}H_{89}CoN_{13}O_{14}PCo$ (approximately); M.W. 1300 (approximately); M.P. above 300° C; soluble in water 1.2% at 25° C; odorless, tasteless, color, red crystalline powder. Hygroscopic, dry material absorbs up to 12% moisture. As per USP Specifications, Crystalline Vitamin B_{12} contains up to 12% moisture and 5% impurities on an anhydrous basis. Use: Therapeutically in the treatment of pernicious anemia, nutritional macrocytic anemia, and in cases of megaloblastic anemias. Its use as a growth stimulant in animal feeds containing little or no animal protein is recommended. Available in commercial quantities. Chas. Pfizer & Co., Inc.

VITAMIN B_{12} CRYSTALLINE TRITURATE

Contains 0.1% Crystalline Vitamin B_{12} on an activity basis blended with mannitol, sodium chloride, or dicalcium phosphate. Each gram contains the equivalent of 1 mg. pure anhydrous Vitamin B_{12}. Use: For dry preparations including tablets and capsules for oral administration of Vitamin B_{12}. Available in commercial quantities. Chas. Pfizer & Co., Inc.

VITAMIN B_{12} ORAL GRADE SOLIDS

Oral grade solids are a light brown, free flowing powder of uniform bulk containing Vitamin B_{12} as in streptomyces fermentation extractives blended with corn starch and traces of calcium stearate and dicalcium phosphate. This material is not hygroscopic and reasonably stable in air of average humidity. It contains 500 mcg. of Vitamin B_{12} per gram of finished product. Use: For easy incorporation into capsules and tablets for oral administration of Vitamin B_{12}. Available in commercial quantities. Chas. Pfizer & Co., Inc.

WATERPROOFING RESIN, SILICONE G-E SR-53

Eliminates cracking, peeling, and effloresceng of exterior masonry walls by providing a durable and invisible water repellent coating that retards moisture penetration. Supplied at 10% solids. May be diluted to 2% solids with aliphatic or aromatic hydrocarbons. Use: Treats concrete, brick, plaster, cinder block, and stucco. Texture and color of treated surfaces are not altered. One gallon of solution will cover 75 to 200 sq. ft. depending n coarseness of surface. Chemical Division, General Electric Co.

WATER REPELLENT FOR MASONRY

A colorless, silicone water repellent easily applied at 5% concentration. Use: To be flooded on to masonry by brushing or spraying. It air dries and cures quickly; forms an invisible, durable, water repellent surface that permits the wall to breathe. Long life and low concentrations required make it very inexpensive. Commercially available. Dow Corning Corp.

WAX S-1167

Synthetic organic high melting point wax; M. P. (Ball and Ring) 120°-125° C; tough, non-brittle and flexible in thin sections; color, black; Sp. g. at 25° C, 0.98; flash point, 250° C min; water and hydrocarbon insoluble at 20° C. Use: As moisture-proofing and insulating wax for electrical components and moisture-proofing barrier for laminated paper boxes. Commercially available. Glyco Products Co., Inc.

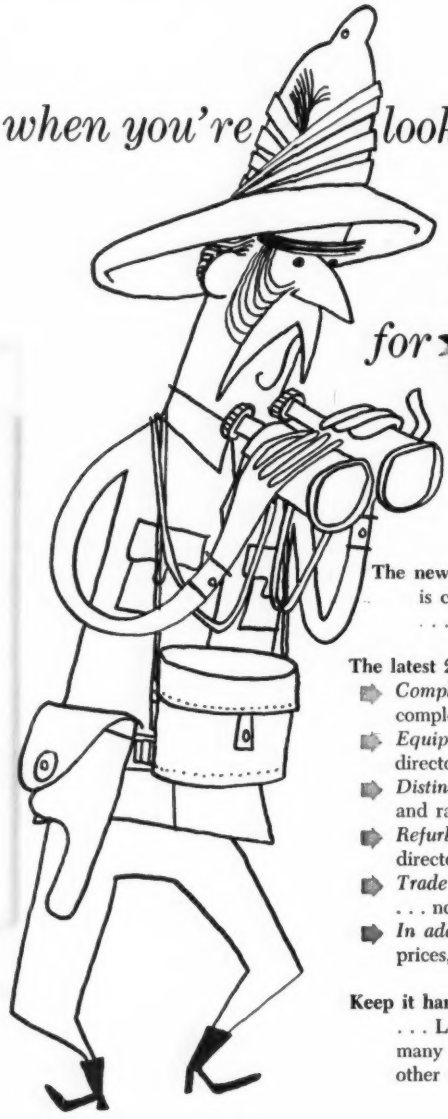
XYNO FINISH 9909

A non-yellowing softening agent effective on cotton and synthetic fabrics. Commercially available. Onyx Oil & Chemical Co.

COMPANY ADDRESSES

Alrose Chemical Co., Box 1294, Providence 1, R.I.
American Bitumuls Co., 200 Bush St., San Francisco 4, Cal.
American-British Chemical Supplies, Inc., 180 Madison Ave., New York 10, N.Y.
American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y.
American Mineral Spirits Co., 155 East 44 St., New York 17, N.Y.
American Polymer Corp., 101 Foster St., Peabody, Mass.
American Resinous Chemicals Corp., Peabody, Mass.
Ansul Chemical Co., Marinette, Wis.
Archer-Daniels-Midland Co., Minneapolis 2, Minn.
Armstrong Cork Co., Lancaster, Pa.
Baker Castor Oil Co., 120 Broadway, New York 5, N.Y.
J. T. Baker Chemical Co., Phillipsburg, N.J.
Barrett Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N.Y.
Bonewitz Chemicals, Inc., Burlington, Iowa
Borden Co., Chemical Division, 350 Madison Ave., New York 17, N.Y.
Botany Mills, Inc., Passaic, N.J.
Brown Co., 500 Fifth Ave., New York 18, N.Y.
Carbide and Carbon Chemicals Co., 30 East 42 St., New York 17, N.Y.
Carlisle Chemical Works, Inc., Reading 15, Ohio
Celanese Corp. of America, 180 Madison Ave., New York 16, N.Y.
City Chemical Corp., 132 West 22 St., New York 11, N.Y.
Colgate-Palmolive-Peet Co., 105 Hudson St., Jersey City 2, N.J.
Commercial Solvents Corp., 17 East 42 St., New York 17, N.Y.
Davison Chemical Corp., 101 North Charles St., Baltimore 3, Md.
Dow Corning Corp., Midland, Mich.
E. F. Drew & Co., Inc., 15 East 26 St., New York 10, N.Y.
E. I du Pont de Nemours & Co., Wilmington 98, Del.
El Dorado Oil Works, Foot of Adeline St., Oakland 20, Cal.
General Electric Co., 1 Plastics Ave., Pittsfield, Mass.
General Mills, Inc., Chemical Department, 2010 East Hennepin Ave., Minneapolis 13, Minn.
Glidden Co., Naval Stores Division, Jacksonville 1, Fla.
Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N.Y.
B. F. Goodrich Chemical Co., 2060 East 9 St., Cleveland 15, O.
Goodyear Tire & Rubber Co., Inc., Chemical Division, Akron 16, O.
C. P. Hall Co. of Illinois, 5145 West 67 St., Chicago 38, Ill.
Heyden Chemical Corp., 393 Seventh Ave., New York 1, N.Y.
Houghton Laboratories, Inc., 322 Bush St., Olean, N.Y.
International Wax Refining Corp., East Hawthorne Ave., & L.I.R.R., Valley Stream, N.Y.
Jefferson Chemical Co., Inc., 711 Fifth Ave., New York 22, N.Y.
Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Cal.
M. W. Kellogg Co., Jersey City 3, N.J.
Kessler Chemical Co., State Road & Cottman Ave., Philadelphia 35, Pa.
M. Michel and Co., Inc., 90 Broad St., New York 4, N.Y.
Minnesota Mining & Manufacturing Co., 367 Grove St., Saint Paul 1, Minn.
Monsanto Chemical Co., St. Louis 4, Mo.
Mutual Chemical Co. of America, 270 Madison Ave., New York 16, N.Y.
National Aniline Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N.Y.
National Starch Products Inc., 270 Madison Ave., New York 16, N.Y.
Ninol Laboratories, 1719 South Clinton St., Chicago 16, Ill.
Nopco Chemical Co., Harrison, N.J.
Onyx Oil & Chemical Co., Warren & Morris Sts., Jersey City 2, N.J.
Ozark-Mahoning Co., Tulsa 1, Okla.
Pennsylvania Salt Manufacturing Co., 1000 Widener Building, Philadelphia 7, Pa.
Chas. Pfizer & Co., Inc., 630 Flushing Ave., Brooklyn 6, N.Y.
Quaker Oats Co., Merchandise Mart Plaza, Chicago 54, Ill.
Reilly Tar & Chemical Corp., 42 Oak St., Tuckahoe, N.Y.
Rohm & Haas Co., Washington Square, Philadelphia 5, Pa.
Sharples Chemicals Inc., 123 South Broad St., Philadelphia 9, Pa.
Shawinigan Products Corp., 350 Fifth Ave., New York 1, N.Y.
Shell Chemical Corp., 50 West 50 St., New York 20, N.Y.
Socony-Vacuum Oil Co., Inc., 26 Broadway, New York 4, N.Y.
Spencer Chemical Co., Dwight Building, Kansas City 6, Mo.
A. E. Staley Manufacturing Co., Decatur, Ill.
Thomas Alabama Kaolin Co., 2412 Ken Oak Road, Baltimore 9, Md.
U.S. Industrial Chemicals Co., 60 East 42 St., New York 17, N.Y.
United States Rubber Co., Naugatuck Chemical Div., 1230 Avenue of the Americas, New York 20, N.Y.
Valite Corp., Whitney Building, New Orleans 12, La.
Victor Chemical Works, 141 West Jackson Blvd., Chicago 4, Ill.
Virginia-Carolina Chemical Corp., Richmond, Va.
Wyandotte Chemicals Corp., Wyandotte, Mich.

when you're looking for sources of supply...



for

CHEMICALS
RAW MATERIALS
CHEMICAL SPECIALTIES
MATERIALS OF CONSTRUCTION
BUILDING MATERIALS AND EQUIPMENT
PROCESS EQUIPMENT AND MACHINERY
PLANT SUPPLIES AND PARTS

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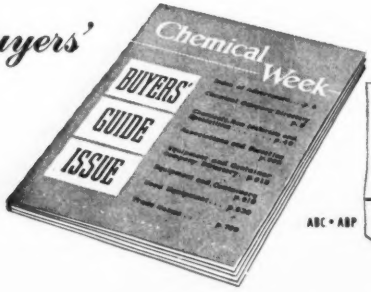

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Chemical Week

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Copper Bridges Color Gap

New dyeing procedures for dynel highlight recent advances in the dyeing of acrylonitrile synthetic fibers.

Most prominent is the copper method, adaptable to most conventional color-types with little inconvenience to the dyer.

At first, dyeing of interpolymers appeared to be the copper method's chief function. But later research proved its value with all-acrylonitrile fibers like Orlon.

Word of another victory in the synthetic fiber industry's struggle to lick its dyeing problems comes this week from Carbide and Carbon Chemicals Co. Division of Union Carbide and Carbon Corp.

Carbide has come up with a practical method for stock dyeing its dynel acrylonitrile-vinyl chloride interpolymer. This research accomplishment probably won't be too long looking for its first money-making employment: New specifications for Marine Corps green kersey call for a 15% dynel–85% wool blend. And contracts for 672,200 yards of the Marine green will be open for bids starting Nov. 26.

Key to the Carbide achievement is a novel technique, known as the copper method, developed by researchers T. A. Feild, Jr. and G. H. Fremon of the company's South Charleston, W. Va., laboratories. Their method isn't the first to put a lasting color on dynel, but so far it's the best.

No Foothold: Dynel, like many another synthetic, doesn't give the dye chemist much to be thankful for. It's a smooth, chemically resistant fiber that offers the dye molecule little in the way of a foothold. Attempts at dyeing the uncooperative material generally have been based on some sort of swelling treatment to loosen up the molecular structure for a better bite at the polymer. High temperatures are known to cause swelling of dynel and dyeing at a boil was a promising early research effort. Then too, chemical swelling agents have achieved a certain measure of success. Combinations of the two approaches are, indeed, satisfactory in certain cases.

But dynel, and the other acrylics, are so hydrophobic that it is well nigh impossible to get full shades with the water-soluble acid, acetate and direct colors by swelling alone. Something more is needed–and that something turned out to be copper in its lower valence state.

In practice the copper method works something like this: In mixed acid and acetate dye formulations, dyeing is carried out at a boil for 20 minutes. Sulfuric acid is then added to adjust acidity. After another boil, copper sulfate mixed with a reducing agent (e.g., zinc formaldehyde sulfoxylate) is added slowly in small increments until the right degree of dye exhaustion is realized. Usually, enough exhaustion is obtained with the cuprous ion, but if a very deep shade is desired, a swelling agent like p-phenylphenol may also be used.

CARBIDE'S FEILD: Not the first, but the best.

According to Carbide, the copper procedure is practical from all angles: It's right for immediate use in commercial equipment; total stock-dyeing time from loading to unloading is estimated at about five hours; cost of all dyes, assistants, wetting agents and scouring materials comes to about 23¢ per pound of stock.

Still a Mystery: No one knows just exactly how the cuprous ion does its beneficial work. Several theories have been put forward: One postulates a simple swelling effect. More plausible is the theory that the copper catalyzes hydrolysis of nitrile groups to amide and carboxyl groups, thereby boosting the polymer's affinity for water. But the most widely accepted explanation is based on the formation of a copper complex between the acrylonitrile and the dye.

Any indecision on the fundamental theory is not reflected in the method's industrial acceptance. Du Pont has done a good deal of work with the technique and says that it has made possible the dyeing of Orlon type 41 acrylic fiber in a full range of shades with good fastness. It's generally conceded that the cuprous ion technique is today the only commercially practical process for dyeing Orlon. Applied research on other acrylics (e.g. Chemstrand) presumably is now under way. In the case of Chemstrand, however, the coloring problem has been reduced to a large extent by inclusion in the fiber of a substance which facilitates dyeing with acid colors.

The copper method has already made possible striking advances in dye technology, but the method's potential is far from exhausted. One dye dividend it promises to synthetics: a sound, commercially feasible continuous process; but that's still one for the researchers.

New Life for Viscose

Dan River Mills has come up with a new fiber modification designed to replace resin coatings normally given to viscose rayon fabrics to prevent shrinkage and to improve crease resistance. As a bonus, the new fiber, unlike those treated with resins, will not absorb chlorine. This means that white viscose rayon fabrics will now be commercially practical.

"I guess it's like a newborn baby," drawled Dan River's L. K. ("Dinks") Fitzgerald last week. "His parents think there's nobody like him in the world. That's the way we feel about our new rayon treatment process, but we sincerely believe that other manufacturers will agree we've got something here."

The process, as explained by Research Director H. Y. Jennings, changes the type of bond linking the different cellulose fibers to each other. From a commercial standpoint, the poor qualities of viscose fiber are due to the fact that the cellulose molecules are linked to each other by hydrogen bonding–hardly the most stable type of bond.

Dan River's process substitutes an ether linkage–from a secondary alcohol group on one of the cellulose molecules to a hydrocarbon–which, in turn, is linked etherwise to another cellulose molecule.

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The process is applied in regular textile machinery as a final step after weaving and dyeing the fabric.

Jennings declines to reveal the reagent used, since the patent situation has not been clarified. Dan River, however, does plan to make the process available to industry, though the method—by licensing or by sale of the reagent—has not been decided.

Final trade name for the process hasn't been decided as yet. At present, it goes under the name "X-2."

On the Plus Side: Unlike resin treatments, which can wash out, X-2 is an irreversible process. Treated fabrics can withstand repeated washings without changing their characteristics.

As with resins, the degree of processing can be manipulated depending on end use of the fabric. Unlike resins, X-2 leaves the "hand" or feel of the fabric unchanged. It can be used equally well on crisp, tightly woven goods and on soft fabrics.

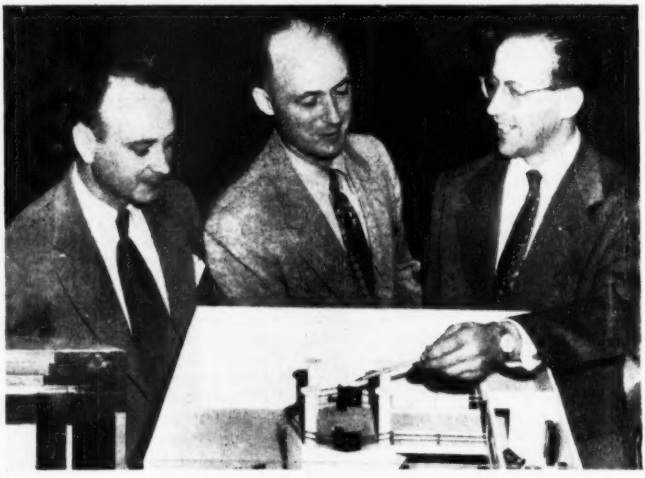
Neither Fitzgerald nor Jennings will hazard a guess on how much of the present textile market for resins will be taken over by the new material. Dan River, itself, plans a complete switchover.

For colored fabrics, the resin disadvantage of chlorine retention is not serious. Under normal conditions such fabrics are never exposed to chlorine-containing bleaches.

FITZGERALD AND JENNINGS: A bracer for the hydrogen bond.

White fabrics, on the other hand, are usually bleached. If a resin-treated fabric is bleached, the chlorine reacts with the resin. When the fabric is ironed, hydrochloric acid is split off, browning, weakening the fabric.

Since X-2-processed viscose does not react with chlorine, white viscose



Coming: Home-Made Hot Atoms

AN ATOMIC REACTOR for every industrial laboratory that can ante up $1 million is the implication of North American Aviation, Inc.'s newest research achievement. North American has come up with a small (19 feet in diameter, 11 feet high) reactor to produce radioactive isotopes. The half-pint isn't a power generator, has no direct connection with the company's aviation program. Chauncey Starr (right), chief of the firm's atomic research, and Guy Inman (left), project coordinator, show off a model of the creation to AEC's Harry Pearlman. Principal working parts already have been built. Design will be released through AEC.

fabrics can now be washed in exactly the same way as other white fabrics. Dimensional stability and crease resistance open new markets for viscose—men's shirts, for example.

Competitive Status: With the newer synthetics coming out of the development stage, such artificial fibers as viscose rayon have been given the back seat. X-2 may change this.

Synthetics range anywhere from three to four times as expensive as rayon, but their other advantages have outweighed these price considerations.

The cost of X-2 processing of rayon is slightly above cost of resin processing. Dan River does not expect this increase to hurt sales; for compared to synthetics, X-2-modified viscose still has a significant price advantage.

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Switch to Penicillin: A new, stable form of penicillin is Chas. Pfizer & Co.'s latest contribution to a growing roster of poultry feed supplements. Pfizer believes penicillin's potential as a feed supplement was never fully appreciated because the antibiotic's instability to pelleting conditions discouraged widespread use. But that may be changed soon. Says Pfizer feed sale manager J. J. Thompson: "There is no doubt that penicillin, now that it has been produced in a stable form, may well become the antibiotic of choice for chick and turkey poult growth stimulation".

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Colorful Three: Hilton-Davis Chemical Co. is out with three new Spectrolene textiles dyes. They are: Blue BB, Red B and Violet B. In practice the Spectrolene colors are coupled with naphthols to give bright shades.

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Cracker Research: New research laboratories are now under construction at Filtrol Corp.'s Vernon, Calif., manufacturing plant. Completion, probably before the middle of next year, will give Filtrol scientists 16,000 square feet of elbow room in which to conduct their petroleum cracking catalyst research.

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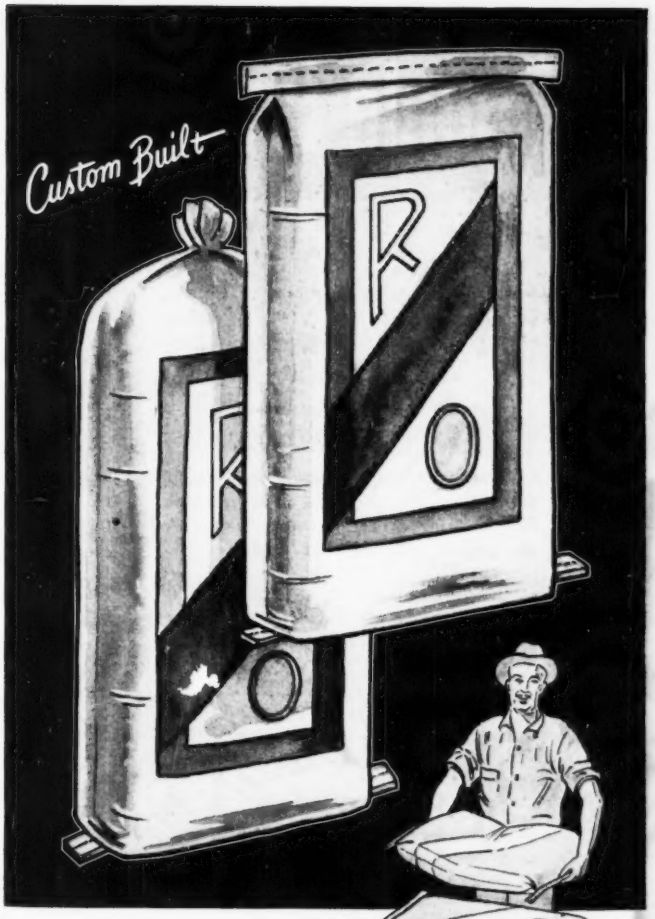
Scorch Stopper: Sun Oil Co. is introducing Sundex-41, a new process aid for cold rubber stocks. Sun says the new product counteracts the accelerating effect of furnace blacks, prevents scorching of cold GR-S during mixing, milling and extruding. Other attributes: aids dispersion of compounding ingredients; reduces power consumption; boosts wear resistance and flex life of cured products; flows freely for easy handling; and has shown no undesirable effect on finished products.



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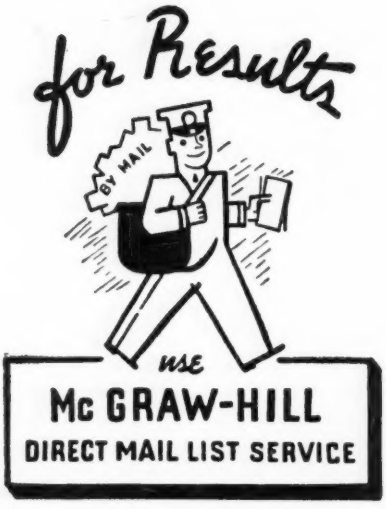

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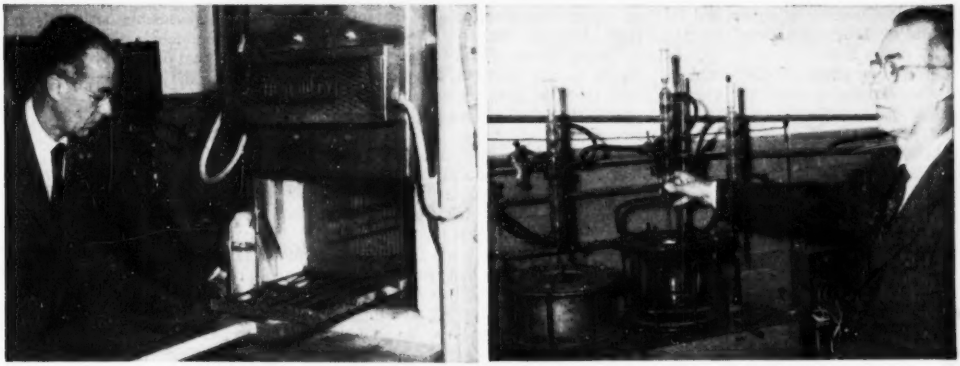


PFAUDLER'S SANFORD: For an established market, practical equipment from a workable theory.

New Frontier for Glass

Equipment lined with a new glass looms as one of the preshow favorites to attract attention at next week's chemical exposition.

The new glass shows improved resistance to bases, but it is not suitable for strong alkaline solutions.

Neutralizations, polymerizations are potential markets. One customer hopes to extend equipment life for a process involving a hot solution of hypochlorite.

Next Monday, chemists and engineers from all over the country will converge on New York City's Grand Central Palace for the 23rd Exposition of Chemical Industries. As in former years, the accent will be on new equipment and materials; new ideas will be the popular medium of exchange.

Over 400 companies will be on hand to market their wares. And one exhibit that looms as one of the preshow favorites to cop a lot of attention is Pfaudler's booth where the company will formally unveil its alkali-resisting glass for use in its glass-lined equipment.

Matter of Degree: Chemical resistance is always a matter of degree; and in this case the term "alkali-resisting" may be somewhat misleading. In its ability to withstand alkaline solutions, Pfaudler's new glass shows marked superiority over conventional grades. However, it is not suitable for use with high concentrations of strong alkalis at elevated temperatures, or for any alkaline solution, under pressure, over 212 F. For relatively mild solutions (pH between 10 and 12) at temperatures under 212 F, it has at least three times the resistance of standard Pfaudler glass.

Pfaudler hopes the material may find a big market in neutralization reactions where the alkali comes in contact with the lining for short periods at moderate temperature. Another potential use: organic polymerizations where the reaction is carried out within the limits of the recommended operating conditions. And the company has already received an order from one customer who intends to use equipment lined with the alkali-resisting glass in a process involving hot hypochlorite solutions. In the past the customer has used Pfaudler glass-lined reactors, but with the new glass, he hopes the life of the process equipment will be appreciably lengthened.

A Practical Theorist: Pfaudler's E. A. Sanford, head of research, was the individual chiefly responsible for the development of the new glass. His key to success: an established market and a workable theory.

Sanford knew the market was there from the requests Pfaudler got from customers. The customers realized that because of the fundamental difference in mechanism of attack, silicate glass could never be made as impervious to bases as it is to acids. But they pointed out that even a moderate increase in resistance would broaden the scope of glass-lined equipment.

Sanford is also an acknowledged master of the theory and techniques of glass. As he puts it: "It's been only in the past few years that we have had any real understanding of glass. It used to be strictly a case of trial and error. Now we can call our shots." And he called his shot when he developed the formula for the alkali-resisting glass on the basis of theoretical considerations.

More Versatile: The new glass is not the whole answer of course, to the problem of corrosion in the process industries. For one thing, the new glass will mean a slightly higher cost for already expensive glass-lined equipment. Furthermore, it cannot be used in connection with strong caustic. But Pfaudler officials wrap it up neatly when they say, "We've got a better all-purpose glass lining than we've ever had before."

At the Source

Although the experimental phase was completed last February (CIW, Mar. 10), the U. S. Bureau of Mines has just got around to publishing its detailed report on the second coal gasification project at Gorgas, Ala. More experimentation is required before the idea can be called technically feasible; but even in the present embryo stage it's arousing commercial interest.

Basically, the concept is simple: Just burn the coal while it is still in the ground instead of mining it.

Original experiments—conducted jointly by the Bureau of Mines and Alabama Power Co. in the fall and winter, 1946-47—proved so promising that the idea warranted a second look.

In 1948, Alabama Power signed a contract with the Government calling for construction and operation of ex-

periment stations by the company. The project was to be supervised by Bureau of Mines personnel headed up by James Elder.

Under the terms of the contract, Alabama Power donated the Gorgas site for the experiments, the Government picked up all the tabs. A tie-up between the two is a natural: The Bureau of Mines is interested in conserving natural resources, also means for producing synthetic fuels and chemicals; Alabama Power looks at the project in terms of more economical generation of power.

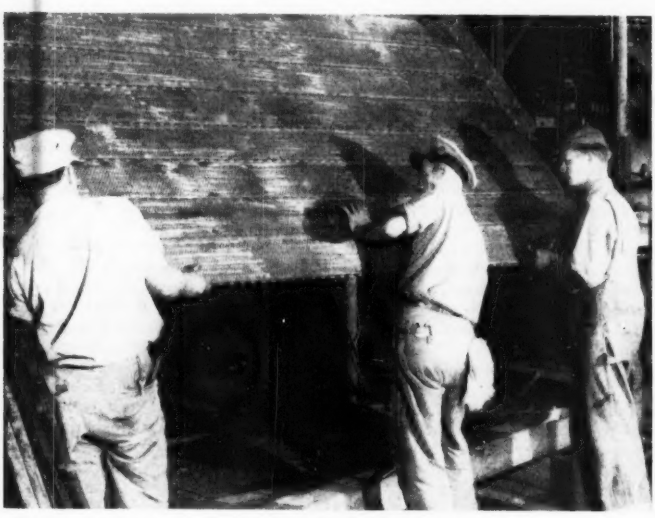
One of the objectives of the second set of experiments was to find out how far the area of gasification could be extended by drilling new boreholes. After 22½ months, Elder came up with the significant conclusion that "there appears to be no definite limit to the area of coal bed that can be exploited in this manner."

Another objective was to find the quantity and quality of the effluent gases. At times, gases with a heating value of 90 to 150 btu per cu. ft. were produced. In one 8-hour period, 90 btu gas was emitted at a rate of 9.4 million cu. ft. per day.

As a result of the work done at Gorgas, Elder and his staff came up with some general conclusions. They found, for instance, that a high rate of combustion of coal and a high rate of oxygen consumption (for combustion) favored higher-quality gases.

Three Ways: From experimental results so far, however, it cannot be said that the process is technically sound. If it does pan out, Elder foresees three possibilities:

- Coal could undergo complete combustion underground and the energy—in the form of sensible heat in the gas—could be used for the generation of power. In this way, the Bureau thinks that an over-all thermal efficiency (based on coal consumed to power generated) of 15 to 20% could be achieved. This compares with an efficiency of 12.5% from conventional mining methods. But the Bureau makes two assumptions in arriving at these figures: 1) that only half the coal in the ground can be brought to surface by present mining techniques; and (2) that all the coal underground can be gasified.
- Coal in the ground can be gasified to form a producer gas which, on combustion, will release energy that will generate power. Because it could not get a continuous, efficient contact, the Bureau was not able to get a steady supply of producer gas.
- Underground coal can be gasified with oxygen and steam to make a synthesis gas for the production of synthetic fuels and chemicals. Although no experiments along those lines were conducted at Gorgas, the Bureau says that idea may be more fruitful than the production of a producer gas.



Stainless Boosts Synthetic

HEAVY DUTY STAINLESS STEEL CONVEYORS at the Government's Port Neches plant (operated by the Naugatuck Chemical Division) have resulted in increased production, also reduced a corrosion problem. Previously, black iron belts were employed for drying the rubber "crumb," but they contaminated the product. The stainless steel ones also better withstand mechanical flexing, and plant engineers report that particles of rubber do not stick to them as they did to the black iron.

Vitamin Ferment

Two researchers from the Department of Agriculture have come up with a new process for producing vitamin B_{12}. A patent has been applied for, will be assigned to the Secretary of Agriculture.

In the process, the vitamin is produced by the fermentation action of propionic bacteria on mashes that contain skim milk or whey. Experimental yields have been obtained which compare favorably with those of current commercial processes. In addition, the process is suitable for increasing the vitamin content of Swiss cheeses and other dairy products. An added attraction, propionic acid, is produced as a by-product.

EQUIPMENT. . . .

Fabric Data: Recent tests on dynel by the Better Fabric Testing Bureau, Inc., augur a big future for the synthetic fiber in industrial applications. In the tests, dynel was immersed for twenty hours in 80 different solutions (including strong acids, strong bases, oxidizing agents and organic solvents). Temperatures varied from room to boiling point. From the results, says Carbide and Carbon, dynel seems to be more resistant to chemicals than any other major textile fiber.

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Surface Thermometer: Pacific Transducer Co. has developed a thermometer specially designed for measuring external temperatures of pipes, molds, motors and other surfaces. A silicone grease is the adhesive between the thermometer and the point to be measured on non-magnetic surfaces; a clamp can be used on magnetic ones. The thermometer will measure temperatures between 0 and 300 F. And, says the company, it has been designed to measure the temperature from the back of the instrument only.

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Sealing Compounds: H. V. Hardman Co. is now producing a line of sealing compounds that are said to combine high electrical resistance and low moisture transmission with the ability to operate over a wide range of temperatures. Hardman says the compounds are ideal for casting and sealing electronic parts, batteries, transformers, coils and condensers.

Sprayed Touch-up

Specialties makers have unearthed another big new market for aerosols: lacquers and enamels for touching-up major household appliances and industrial equipment.

More than a million units will be produced this year. Lacquers are leading the parade, but enamels are now being aerosol-packed for on-the-spot repairs too.

Repairing the inevitable mars and scratches that result from shipping and handling has always been a big problem in the major household appliance and industrial equipment fields. A scraped refrigerator means an unhappy customer, a return trip to the warehouse, lost time, and mounting labor costs.

Now aerosol-dispensed lacquers and and enamels are becoming the prize damage-control "tools" in the maintenance man's kit. The idea: Touch it up, don't send it back. Big manufacturers like Westinghouse, Hot-Point, Mullins (Youngstown Kitchens), and Remington-Rand are having their factory finishes aerosol-packaged for distribution through company outlets.

And demand for these "on the spot" units is jumping. Aerosol lacquers alone are expected to hit the million-can mark this year. Most of these are for the industrial trade. But it's not all lacquers: Touch-up enamels, which are just coming into the picture, will account for a big share of next year's spray enamel sales.

Out In Front: Initiator of the trend and largest filler in the industry today is Sprayon Products, Inc. A year ago this Cleveland company packaged 35,000 cans monthly under its own and contracting company labels. Sprayon's average this year has been 50-75,000 units per month and on completion of its new 18,000 sq. ft. plant, the total will be pushed even higher.

Among the more recent fillers in the touch-up field are Power-Pak, Inc. (Bridgeport) and Eveready Pressurized Products, Inc. (Cleveland) for the lacquers, and Chase Products Co. (Maywood, Ill.) and Aeropak, Inc. (Chicago) in the enamels.

Spray-dispensing lacquers and enamels is not brand new, but a number of technical difficulties have been holding back progress. Enamels especially, because of their large pigment particle size, have proved difficult to keep in suspension. They easily clog the tiny (15/10,000-inch diameter) spray orifice, may be incompatible with the Freon propellants, and if not properly formulated, may bubble or run when sprayed on vertical surfaces. And messy jobs from bubbles and runs don't make for re-orders.

AEROSOL PAINTS: On-the-spot damage repair.

Lacquers have proved somewhat more satisfactory since their pigment particle size is smaller. They not only stay in suspension better, but do not have as great a tendency to clog the spray orifice.

Both lacquers and enamels are relatively expensive: A 12-oz. dispenser sells for $1.59-$1.95, yet contains only one-third as much paint as an ordinary quart can at the same price.

Just the Start: But balancing all this is the convenience of aerosol-dispensed paints. If correctly formulated and applied, the finish has a professional factory-fresh look that no amount of brushing can produce.

At least one company, Precision Valve (Yonkers, N.Y.), already has a valve which is claimed to be free from objectional plugging. Other companies working on new valves are Engstrum Associates (Washington), Pressure Pack (Detroit), Dyna-Spray and Dupli-Color Products (both Chicago).

The settling, streaking, and bubbling problems are being licked by more stable formulations.

And although the touch-up market for household appliances and industrial equipment is just opening up, specialties manufacturers are already finding new fields to conquer. Rumor has it that within six months at least one company will be on the market with its own line of touch-up finishes for the vast automobile market.

Other markets which look promising are the refrigerator-washing machine reconditioning field, and the huge furniture industry.

New Fare for Rats

Fumol Corp. will soon be marketing synergized dehydroacetic acid as a mold inhibitor for rodent baits containing the new rodenticide warfarin. Being odorless and tasteless, the material doesn't produce "bait shyness" while performing its function of keeping bait unspoiled.

One of the main features of warfarin, too, is that rats consuming it don't become bait-shy. They continue to eat wafarin-containing bait until they die of internal hemmorrhage. For the rodenticide is a blood anti-coagulant (chemically, 3-(α-acetonylbenzyl)-4-hydroxycoumarin, that is odorless and tasteless.

But the typical warfarin bait consists of .025% warfarin and 99.975% cornmeal or cereal. This finished bait is subject to mold in storage, and rodents do not take a moldy bait readily. While there are inhibitors that will effectively arrest such spoilage, formulators require one which will not in itself impart a taste or odor at use concentrations, and hence nullify the advantages of warfarin. It must also be relatively non-toxic to lower domestic animals.

The Long Island City, N.Y., specialties company thinks that Vitane W 20, as it calls the new product, will meet all these specifications. It is the development of John Winkler, a consulting chemist now associated with Fumol on such problems, who has on file a patent application on the use of synergized dehydroacetic acid as an anti-microbial compound.

Cheap Enough: Winkler, understandably reticent about the identity of his synergist, reports that his material increases the anti-microbial activity of dehydroacetic acid about 300%. A boost of this order is good news to cost-conscious rodenticide

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compounders since it is possible to get satisfactory mold inhibition with .2% (by weight of bait) of synergized dehydroacetic acid. Ordinary dehydroacetic acid, on the other hand, though possessing appreciable mold-inhibiting properties, must be used in amounts up to 1% to prevent mold growth on food.

The product is not yet on the market, but within three-four weeks, compounders will be talking about "Vitanized warfarin".

Fumol is not stopping at rat bait, however. It has a testing program to explore the potential of Vitane on poultry and cattle feed, dog food, seeds, flower bulbs and nursery stock subject to microbial decay.

Bleach Hassel

Liquid bleach manufacturers will not stand idly by and let powdered bleach makers claim that a 10-oz. package of a sodium perborate formulation is equal to two quarts of hypochlorite bleach, if the action of Sinclair Manufacturing Co. is any criterion. Last week that 40-year-old Toledo household specialty company refuted such label and advertising statements with a blast in the *Toledo Times* as its "Sunrae Liquid Bleach answered powdered bleaches."

What is particularly significant about this open battle ("Ladies, you be the referee") is that Toledo is the area where Du Pont recently had a market survey made on powdered bleaches which led it to believe that the future for perborate products is promising *(CW, Oct. 20)*.

Also, Tidy House Products Co. (Des Moines), manufacturer of Dexol, one of the new powdered bleaches, has been using full- and half-page ads in the *Toledo Blade* and *Toledo Times* for its product.

A number of strong claims for Dexol was made in these ads: "As many as 73% of those who tried Dexol prefer it to bottle bleach; world's largest-selling powder bleach, twice as effective as Product 'B', 3 times as effective as Product 'C'; 10-oz. package equals 2 quarts of bottled bleach." Loudest drum beating, however, was for its safety on nylons and rayons.

Obviously challenging Dexol, the Sunrae maker said the claims "seemed exaggerated", asked the ladies to compare "any of the sodium perborate powders sold as 'safety bleaches'." It was confident the powdered product couldn't begin to compare with its hypochlorite bleach; recounted its tests with perborate bleaches that decided it against marketing one.

Sinclair did, however, admit that powdered bleaches may be safely used on woolens and rayons, as it drove home its point that on cottons and linens—"the big use"—they are "far less efficient and far more costly" than a product like its Sunrae.

The ladies in the area have more than just Dexol to compare, for both Gold Seal's "snowy", set for a national push, and Sage Laboratories' Safety Bleach are being distributed there. Gold Seal makes no objectionable claims, but the Safety Bleach label is deemed misleading by Sinclair.

Backing Sinclair is at least one buyer for a large food chain in the city. He states that his laboratory tests showed that it would take 19 packages of powdered bleach to do the work of one quart of bottled bleach.

•

Glass for Cans: Butcher Polish Co. has just begun to ship quart sizes of its Rubless and Water Proof Green Stripe wax in bottles instead of cans, will do likewise with pints shortly. And half-gallon sizes of the products are no longer available. Reason: NPA restrictions on tin.

•

Solvent for Aromatics: Dodge & Olcott's just-developed product, Solvarom, is a new high-boiling, polyoxy aromatic ether especially useful as a solvent for all crystalline aromatic chemicals, gums and resins. The New York essential oils house claims that for these purposes it is superior to diethyl phthalate, benzyl benzoate, benzyl alcohol and similar organic solvents.

•

Roman in Georgia: Roman Cleanser Co., Detroit, is invading the Southern market for the first time with its Roman Cleanser Bleach through the purchase of two Georgia companies: Noboil Cleanser Co., Atlanta, and Barton Chemical Co., Barton.

•

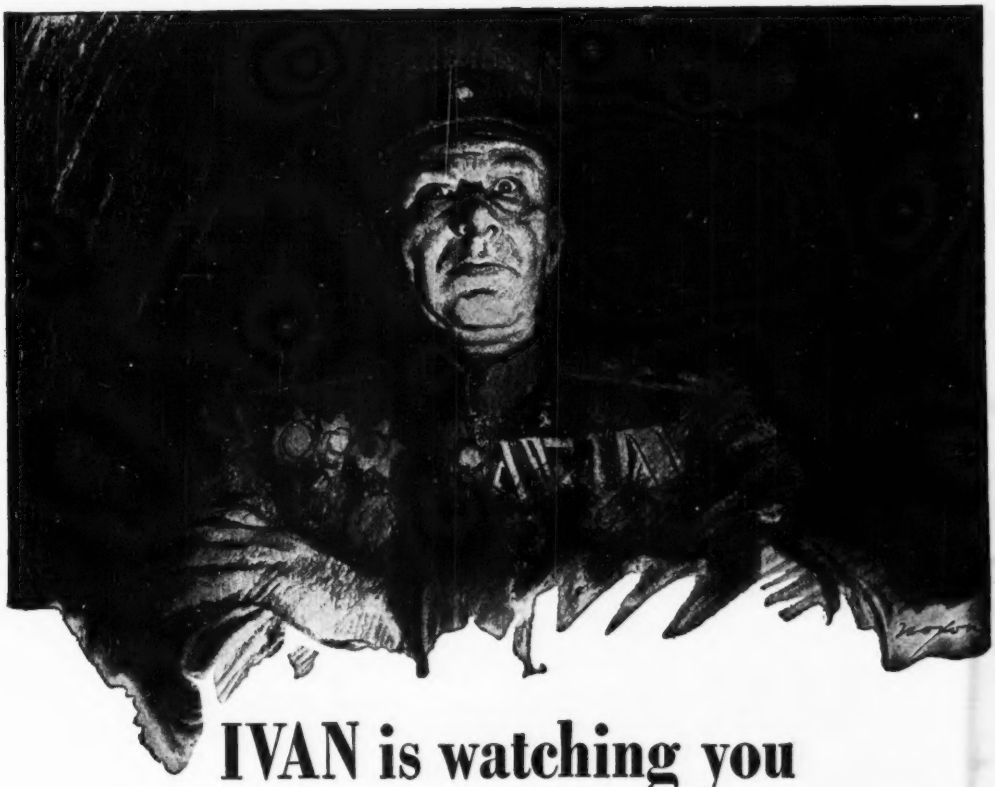
New N.C. Company: National Hog Medicine Co., Inc., Raleigh, has been organized with capital stock of $100,000 to deal in medicines for animals.

•

Branch Plant: A new chemical plant will be opened in Dalton, Ga., by Farm & Industrial Chemical Co., an Atlanta firm making chemicals for laundries.

•

2,4,5-T Intermediate: Hooker Electrochemical Co. (Niagara Falls, N.Y.) now has available from a new plant commercial quantities of 1,2,4,5-tetrachlorobenzene, an intermediate used in making the weed killer 2,4,5-trichlorophenoxy acetic acid.



IVAN is watching you

IVAN is a dyed-in-the-wool Communist. There are only 6 million party members like him in all Russia, yet these Communist brass-hats enforce the iron dictatorship of the Kremlin over *200 million* Russians.

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Ivan is working hard to beat you down. He has a big head start.

Right now he's got you in a bad spot.

Ivan is afraid of only one thing.

He fears your ability to out-produce him in guns, tanks, planes.

Frankly, he doesn't think you value your free system enough to do it . . . to make willingly the sacrifices he has squeezed out of the Russians.

But he's wrong!

Because you and all of us have set out to build more and better weapons—to do it faster all the time.

We must use every bit of know-how and inventive skill we have to improve our machines and methods—to turn out more and more for every hour we work. Only in this way can we become militarily strong.

But we've got to supply essential civilian needs as well. We can't allow needless shortages to take prices skyrocketing and lower the value of our dollar.

Sure, that means sacrifices for everybody. But doing this double job well is the only sure way to stop Ivan in his tracks—and to save the freedoms which are ours and which he has never known.

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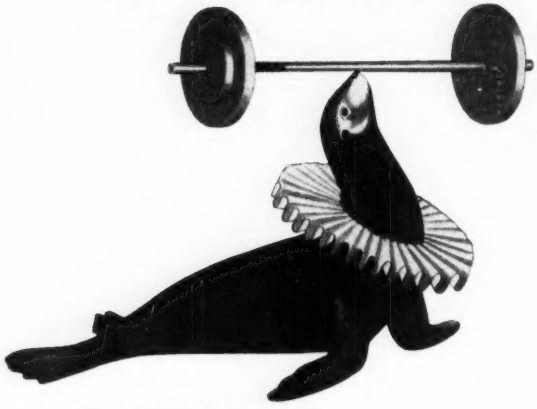

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SPECIALTIES . . . .

Ferd, Muhlens Purchase: Raymond Lee and John Roosevelt of Lee Pharmacal Co., have had their bid for the capital stock of Ferd, Muhlens, Inc., cosmetic manufacturer with New York offices and a Jersey City plant, accepted by the Office of Alien Property.

•

Snow Race: Chase Products (Maywood, Ill). has jumped into the aerosol "snow" business, is packaging Spray Sno at full speed to beat the Christmas deadline. The product (12-oz. can) sells for $1.75.

•

DDT Doesn't: DDT powder for body lice doesn't kill the Korean variety, according to Comdr. H. S. Hurlbut, head of the Navy's Fleet Epidemic Disease Control Unit No. 1, in a report to the Navy Bureau of Medicine and Surgery.

•

Optical Whitener: A new fluorescent whitener, 4 - methyl - 7 - diethylamino coumarin, is going into production at Carlisle Chemical Works (Reading, Ohio). It can be used in masking yellow colors in oils, paper, white polishes, paints and lacquers, as well as textile fibers.

•

Processing Size: A nylon size, Goodrite TS-20 has been introduced by B. F. Goodrich Chemical Co. The product is designed specifically to satisfy the need for an improved material for single end sizing and warp slashing.

•

Mexican Sales: Export Chemical Corp. of Colorado (Denver) has joined with the Mexican affiliate of Cook and Co., Memphis cotton merchants, for the sale of Colorado .44 brand insecticides and agricultural chemicals throughout Mexico.

•

Paint Additive: Hercules Powder Co. has introduced a stabilized grade of chlorinated rubber, used as an additive in making industrial maintenance paints. Advantages include a marked improvement in heat and light stability, better weathering, a reduction in under-film rusting and better stability while stored in the can.

•

German Wood Preservers: Newly placed on the German market are two wood preservatives, Hordazit Paste and Hordazit 100. Manufacturer is Lech Chemie Gersthofen. The paste is an oil-salt combination, with the oil component giving water-resistant as well as fungicidal qualities. The second product is a combination of chlorinated mineral oil and phenol chlorides.

BOOKS .....

Fundamentals of Supervision, by Charles A. Harad. Delmar Publishers, Inc., Albany, N.Y.; 224 pp., $3.75. Accompanying **Conference Leader's Guide,** 73 pp., $2.

With a view to the plight of modern industry which is now facing a dearth of trained supervisory personnel, this volume presents the fundamentals of good supervisory practices and techniques for effective handling of the job's responsibilities. The supervisor's duties are defined and discussed in line with the general objectives of increasing production, improving safety conditions, reducing spoilage, training employees for higher positions, etc. Using a practical approach, the book is organized into 28 units, with each unit developed according to the training procedures of preparation, presentation, application and testing.

Developed specifically for use with the above volume is the *Conference Leader's Guide*, which presents an itemized plan for conducting conferences and for leading group participation on each of the topic-units covered in the text.

The New Fibers, by Joseph V. Sherman and Signe L. Sherman. D. Van Nostrand Co., Inc., New York, N.Y.; 531 pp., $6.

In scope, this volume can serve as an index to the new fibers which have become significant in the last ten years. The authors have attempted to correlate the facts—scientific, industrial and economic—concerning these fibers and to tie this information in with the general textile-industry picture. Each new fiber is discussed in regard to its history, development, methods of manufacture, properties, applications, patents and potentialities. Tables, graphs and charts, along with process-diagrams and photographs, aid in clarifying the text material. Some of fibers dealt with here include nylon, vinyl resin fibers, glass fibers, protein fibers, rayons, cellulosic fibers and others.

The Surface Chemistry of Solids, by S. J. Gregg. Reinhold Publishing Corp., New York, N.Y.; ix+297 pp., $8.50.

As a survey of the various branches of the surface chemistry of solids, this book is concerned with general principles rather than details of observations or descriptions. The author covers all those chemical and physicochemical phenomena which relate to the activity of the surface of a solid, or to the interface between a solid

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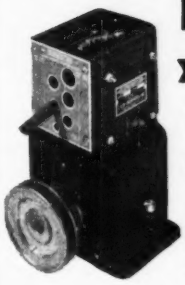

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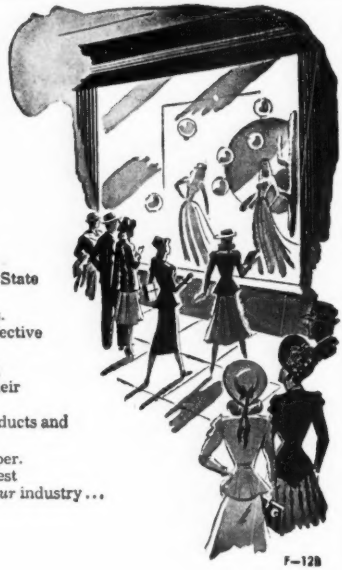


F-12B

McGRAW-HILL PUBLICATIONS

BOOKS . . . . . .

and a gas, a liquid or another solid. Throughout the volume, the author emphasizes the consequences of a field of force at the surface of the solid—adsorption, adhesion, spreading phenomena, catalysis and related effects. All these subjects are of importance to those engaged in agriculture, lubrication, paints, rubber, paper, petroleum refining, detergents and other industries.

Briefly Listed

PATENTS FOR TECHNICAL PERSONNEL, by Worth Wade, 40-p. reference manual on inventions and patents, intended to supply supervisory and technical employees and technical students with information on the functions of a Patent Department, recognizing an invention, keeping records, protecting patents, and benefits to be derived from inventions and patents. Chemonomics, Inc., 400 Madison Ave., New York, N.Y., $3.

GERMAN BOOKS ON CHEMICAL & COGNATE SUBJECTS, second revised edition of bibliography covering scientific and technical books published from 1939 to 1950. Fields covered include the various chemical and physics branches plus metallurgy, physiology, food, chemical technology, etc. Books known to be in active preparation were also noted. Published by Lange, Maxwell & Springer Ltd., 41-45 Neal St., London, W.C. 2., England. free on request.

MEETINGS . .

Chemical Industries Exposition, Grand Central Palace, New York, N.Y., November 26-December 1.

Chem. Specialties Mfrs. Assn., annual meeting, Mayflower Hotel, Washington, D.C., December 2-4.

Amer. Inst. of Chem. Engrs., annual meeting, Chalfonte-Haddon Hall, Atlantic City, N.J., December 3-5.

Natl. Assn. of Mfrs., annual meeting, Waldorf-Astoria Hotel, New York, N.Y., December 5-7.

Soc. of Cosmetic Chemists, annual meeting, Biltmore Hotel, December 6.

Proprietary Assn., scientific section, Biltmore Hotel, New York, N.Y., December 7.

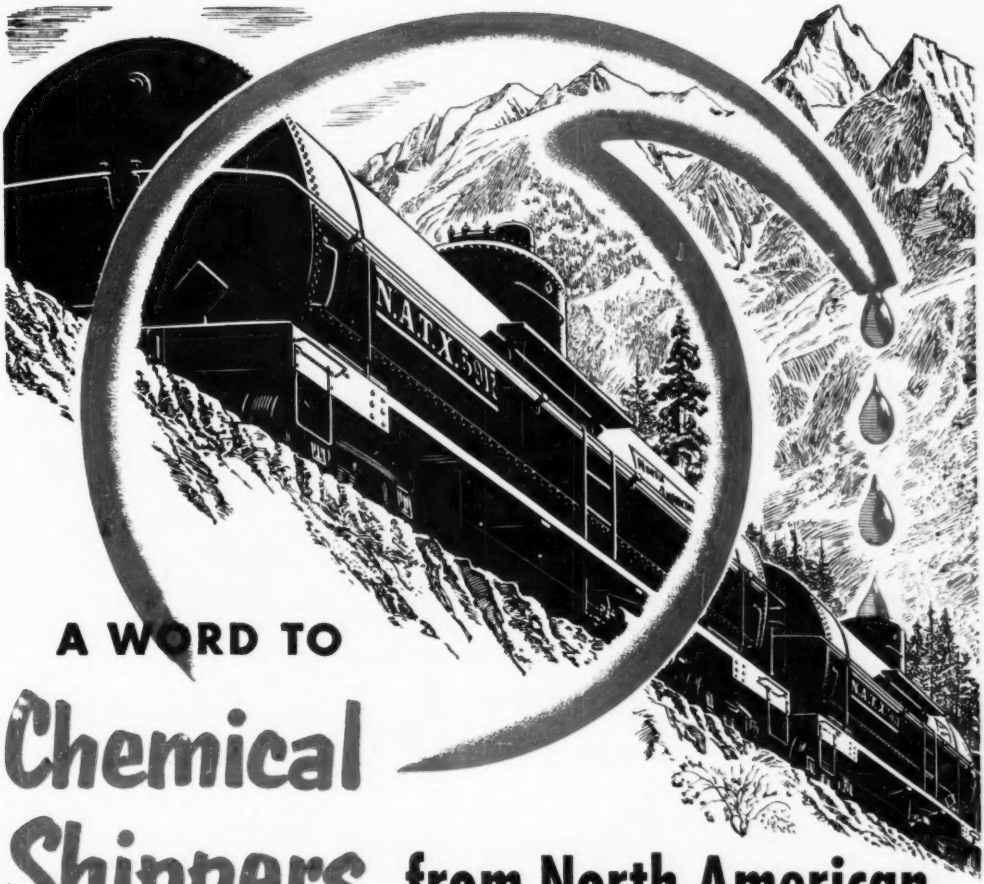
Synthetic Organic Chem. Mfrs. Assn., annual meeting, Commodore Hotel, New York, N.Y., December 11.

Compressed Air & Gas Inst., The Drake, Chicago, Ill., December 11-12.

Manufacturing Chemists' Assn., Inter-Industry Conf. on chemicals in foods, Statler Hotel, New York, N.Y., January 15, 1952.

PICTURES IN THIS ISSUE:

Page 13—Commercial Photo; p. 15—Humble Oil Refining Co.; p. 16—Staley Manufacturing Co.; p. 44—Wide World; p. 48—U.S. Rubber Co.



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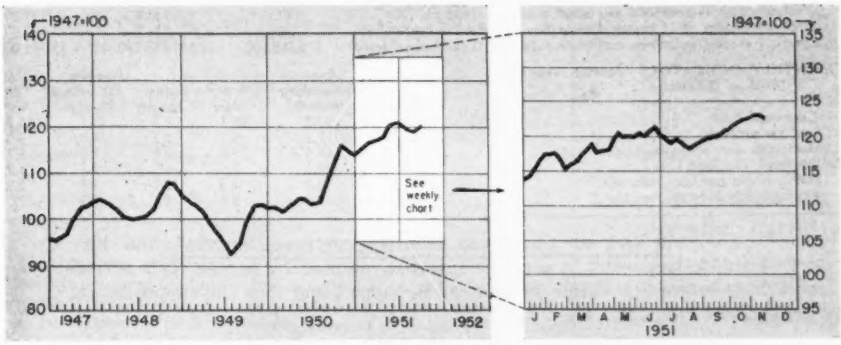
MARKETS . . . . . .



CW Index of Chemical Output—Basis: Total Man-Hours Worked in Selected Chemical Industries

Shortages of chemicals in many cases can't be blamed on supplies of raw materials. Rather, the difficulty is in getting structural steel for plants, and other metals for processing equipment.

And the outlook for improvement is bleak. The Defense Production Authority has just made its new steel allotments for the first quarter of 1952. Total for the chemical industry: zero.

Construction of some chemical plants is being halted by the lack of steel; but even worse, nearly-built plants are being held up by the scarcity of critical metals. For example, among the current victims of the nickel shortage: synthetic glycerine, phenol, piperidine.

Other alloys like stainless steels are woefully inadequate to cope with demand. Manufacture of nitric acid by oxidation of ammonia is seriously stymied by lack of stainless. The Munitions Board thinks it may have a way out: activation of standby wartime ordnance plants.

In the meantime, use of ammonia in liquid form for fertilizer use, rather than as sulfate or nitrate, is being encouraged. Many believe it is just as efficient to apply the ammonia that way, but prior progress has been slow. It's partly a matter of re-education.

Agriculture is somewhat miffed that its share of sulfur chemicals will fall short of expectations. But much of industry is in just as bad a fix—if not worse. In another move to conserve sulfur supplies, NPA amended order M-69 on inventories. The gist: Users are limited to an average 25-day inventory.

This new edict, however, does not restrict larger deliveries if these are usual. But additional shipments can't be received until the customer's stocks are at this level. In border-line cases, NPA warns that intent to comply must be evident.

The need to tighten up sulfur controls is reflected in the output of carbon bisulfide, some 50 million pounds short of 1952's estimated requirements of 513 million pounds. The rayon and cellophane industries took 63% of the total supply last year.

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947 = 100)	123.9	122.9	115.2
Bituminous coal production (daily average, 1000 tons)	1,900.0	1,877.0	1,858.0
Steel ingot production (thousand tons)	2,073.0	2,021.0	1,981.0
Wholesale prices—chemicals and allied products (1926 = 100)	140.2	140.9	135.2
Stock price index of 14 chemical companies (Standard & Poor's Corp.)	226.0	221.9	197.6
Chemical process industries construction awards (Eng. News-Record)	$79,385,000	$15,165,000	$3,759,000

MONTHLY INDICATORS—Foreign Trade (Million Dollars)	Exports			Imports		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
Chemicals, total	85.3	91.5	65.7	21.3	27.1	15.9
Coal tar products	6.8	7.1	5.1	6.8	4.9	3.3
Medicinals and pharmaceuticals	23.5	26.5	20.9	0.8	1.7	0.7
Industrial chemicals	15.8	18.1	8.5	6.5	12.1	5.9
Fertilizer and fertilizer materials	5.2	4.5	4.8	5.9	7.6	5.1
Vegetable oils and fats, inedible	9.3	9.3	5.2	4.6	6.9	11.0

As long as the rayon industry continues sluggish, the 10% bisulfide lack won't be a problem. But rayon men are hoping for a revival long before new sulfur sources can be tapped, and then the supply debate will be resumed.

For most agricultural chemicals, the supply outlook is definitely brighter. Potash output is slated to rise at least 5% next year, and the most popular pesticides—DDT and BHC, in particular—will even be plentiful enough to warrant sizable exports without demur.

It's a fact that superphosphate, jumbo consumer of sulfuric, will be about 8% short of demand. But NPA and the Phosphatic Industry Fertilizer Committee are exploring how to get better geographical distribution. Problem: to bring the acid, the rock, and the fertilizer market together.

Even the Office of Price Stabilization feels more benevolent this week. Price controls on corn cobs, basic material in furfural manufacture, have been erased. The move is expected to speed the collection and flow of this agricultural by-product to meet stepped-up-needs for furfural.

Both industry and agriculture will reap benefits from closer cooperation between the NPA and the Office of International Trade. OIT is cracking down on exports of supply-shy chemicals, and now requires licenses in a number of cases where none was formerly required. Many agricultural chemicals are on the license list for the first time.

NPA has been doing some sleuthing itself, decided to ease supply controls on a few chemicals, clamp down on more in a new anti-hoarding campaign. Most notably easier: industrial alcohol, glycerine, benzene.

Since the RFC recently halted its 100 million gallon alcohol buying program, that commodity has become far more plentiful. Glycerine, too, is more abundant as other polyhydric alcohols have edged into some markets. And benzene is easing with the advent of new petroleum-benzene facilities.

But NPA turned tougher on 43 chemicals not heretofore inventory-controlled. Most of them, however, have been on allocation or some other form of distribution control. Examples: chloroform, copper chemicals, naphthalene, and pyrethrum.

One prong of the newly-modified NPA action is directed at the chemical resale market. Primarily NPA seeks to limit speculative buying of defense-needed chemicals.

SELECTED MARKET CHANGES—Week Ending November 17, 1951

	Change	New Price		Change	New Price
UP					
Zinc Sulfate, cwt	.70	6.85	Castor Oil, dehydr.	.01	.3960
DOWN					
Isobutyl Alcohol, dms., cl., delvd	.02	.175	Rosin, gum, WW, N.Y., cwt.	.20	10.30
Stearic Acid, dbl. pressed	.0125	.125			

All prices per lb. unless quantity is stated

Phenol—Not Better Soon

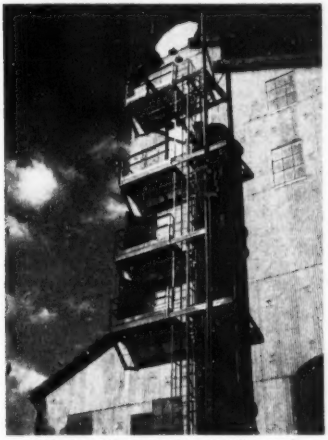
No sizable boost in phenol output is slated for about a year, contrary to earlier hopes.

Despite a temporary easing in supplies, civilian consumers can expect the market to get tighter in the meantime.

Prices are 1-2¢ a pound above pre-October levels, as a result of higher costs of benzene.

Then next year will be drawing to its close before phenol customers can expect to be better off than they are right now. For steel and equipment shortages have stymied would-be producers' expansion plans, basis for an earlier optimistic supply outlook.

Civilian industry will have to get by in the meantime with additional output made available in 1951, hoping that defense demands won't leave it in a state of suspended animation.



MORE PHENOL: Stymied by steel.

But there may be times when supplies improve temporarily because of changing seasonal demand. This month in fact is such a time, and prudent buyers taking advantage of it.

To meet the rising business tide for phenol and phenolic resins, two producers will make more this year than they did last. Dow Chemical Company completed its phenol expansion this March. Bakelite Division of Union Carbide and Carbon Corp. is gradually bringing its Marietta, Ohio plant into capacity operation, will be in full swing by the end of the year.

But there are others who are just as eager to get their share of the phenol sales. Durez Plastics & Chemicals hankers to double its present production, has narrowed down the possible plant sites, but can't build because metal and equipment are lacking. The Barrett Division of Allied Chemical & Dye Corp. wants to get rolling on its phenol-from-cumene process at Philadelphia. And only last week, Standard of California readied plans to construct a $4 million plant on the West Coast, first in that area. All of them face the same bottlenecks.

More To Pay: It's small consolation, but phenol producers will have less trouble getting benzene than they had earlier this year. With benzene-from-petroleum facilities slated to come in more rapidly in 1952, the raw material problem will be relatively minor.

The higher cost of petroleum benzene (around 55¢ a gallon) has been a financial thorn to phenol makers. In seeking relief, most of them have gone over to CPR-22 pricing since October. This move permitted a 1-2¢ a pound boost in the price of phenol. Today the prevailing quotation is about 19½¢ a pound.

Many phenol buyers have been harder hit by this increase than others, as an industry advisory committee recently told the Office of Price Stabilization. It seems that about half the phenol production is captive, the rest purchased. Those who have to buy are tightly trapped in the vise between higher phenol costs and OPS ceilings on products from phenol.

Relief may be in sight, though not right away. Processors of phenol can expect some help price-wise when they file under the now-mandatory CPR-22 regulation. But better yet, they would like to see OPS work out a realistic price setup for the industry.

Supply Lines: Just as bad as the price squeeze, but less easy to remedy, is the phenol shortage itself. Though sizable amounts of phenolics go for defense purposes, civilian consumption is considerably greater, and destined for a new upsurge.

Huge tonnages will be needed in making foundry molds and for bonding wood wastes. If these markets develop as fast, and become as big as many believe, other phenol customers will be thankful to receive as much in 1952 as they will this year.

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GOVERNMENT NEEDS

Bid Closing	Invitation No.	Quantity	Item
General Services Administration, Public Assistance Office, RM. 528, U.S. Court House, Chicago 4, Ill.:			
Nov. 28	CH-35522	170 ea	Extinguishers, fire, soda and acid type
Nov. 26	CH-35054	50,000 lbs	Soda ash, 100 lb. bags
Commanding General, New York Quartermaster Procurement Agency, 111 East 16th Street, New York, N.Y.:			
Nov. 27	52-540-B	2,200 lbs	Glue, animal, ground, 50 lb. waterproof bags
		2,000 pt	Glue, liquid, 1 pint cans
		154,120 lbs	Glue, marine, 28 lb. boxes and 300 lb. drums
		7,100 lbs	Glue, urea-resin type, powder, type 11, 5 lb. cans
Aviation Supply Office, 700 Robbins Ave., Philadelphia, Pa.:			
Nov. 29	B54215-B	2,500 gal	Varnish, electrical, insulating
General Services Administration, Region 8, Bldg., 40 Denver Federal Center, Denver, Colorado:			
Nov. 27	89-B	54	Paint, etc.
	89-C	6,700 gal	Wax, liquid and paste
Regional Information Officer, Region 3, General Services Administration, Washington 25, D.C.:			
Nov. 26	2M-4570-R	12,500 lbs	Soap, paste, grit, hand type 1
		12,000 lbs	Powder, scouring, type 11, 300 lb. barrels
		11,040 lbs	Powder, scouring type 111, 1 lb. sifter top cans
		18,750 lbs	Soap, grit, 10 lb. cakes, wrapped
		80,000 lbs	Soap, laundry, powdered
		1,540 gal	Soap, liquid, toilet
		275,000 lbs	Soap, powdered
		2,450 lbs	Soap, Borax, powdered for dispensers
		35,000 lbs	Soap, toilet, powdered, for dispensing machine
Dec. 4	2W-4573-R	7,812½ lbs	Soap, grit, 10 oz. cake
		156,000 lbs	Soap, laundry, 16 oz. cakes
		8,600 lbs	Soap, laundry, powdered, 1 lb. box
		1,800 gal	Soap, liquid, toilet, 1 gal. cont.
		30,000 lbs	Soap, paste, general cleaning 25 and 100 pound
		50 cases	Soap, toilet, white, 2 oz. cakes, wrapped, 500 cakes to case
	2W-4576-R	6,300 qt	Polish, furniture, 1 qt. cans
	2W-4574-R	2,800 lbs	Sodium, bicarbonate powder, tech., 100 lb. container
		270,000 lbs	Soda ash, 100 lb. container
		8,000 lbs	Caustic, soda, 400 lb. drums, 13 oz. cont.
General Services Administration, W.J.W. Building, Fifth Floor, 1375 Euclid Avenue, Cleveland 15, Ohio:			
Nov. 26	CL-1008-52	9,390 lbs	Soap, toilet, 2 items
Nov. 27	CL-1131-52	12,000 lbs	Trisodium phosphate
Oklahoma City Air Materiel Area, Tinker Air Force Base, Oklahoma City, Oklahoma:			
Nov. 26	IFB34-601-52-215B	120,000 cu ft	Argon gas
Chief, Procurement Division, Supply Service, Veterans Administration, Washington 25, D.C.:			
Nov. 29	S-133	164,450 lbs	Laundry sour and blue
Nov. 27	A-31	3,216 btl	Hexavitamin capsules
		1,920 btl	Ascorbic acid tablets
		960 btl	Codeine phosphate tablets
		1,080 btl	Glyceryl trinitrate tablets
		1,344 btl	Glyceryl trinitrate tablets
		2,832 btl	Hexavitamin tablets
Aviation Supply Office, 700 Robbins Ave., Philadelphia, Pa.:			
Nov. 27	B54201B	38,385 gal	Enamel—synthetic, gloss, oil, modified Alkyd resin
		20,530 gal	Paint, aluminum, ready to mix, various specifications
	B54207B	43,200 gal	Enamel, semi-gloss, rapid drying
General Services Administration, 630 Sansome Street, San Francisco, California:			
Nov. 27	SF-251	7,200 ea	Plasticware, forks, knives and spoons
Regional Information Officer, Region 2, General Services Administration, 250 Hudson Street, N.Y., N.Y.:			
Nov. 26	NY-2B-34533	21,000 pkgs 900 cans	Photo chemicals
Chief, Procurement Division, Supply Service, Veterans Administration, Washington 25, D.C.:			
Nov. 28	S-130	245,724 lbs	Scouring powder
		83,311 lbs	Soap grit, 10 oz. cakes
		513,000 lbs	Soap powder
Nov. 29	S-131	50,715 lbs	Calcium hypochlorite, 3-¾ lb. can
	S-132	19,350 gal	Compound, water and stain repellent, 30 gal.

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SEE PAGE 62

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GENERAL

Chemical Services 64M

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- Alcohols T50
- Ammonia 1b
- Borax B18a
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POSITION _____

COMPANY _____

ADDRESS _____

CITY & STATE _____

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Expires February 24, 1952

BOOKLETS . . . .

Chemicals

Synthetic Petroleum Resins

15-p. technical brochure discussing the physical and chemical characteristics of the firm's synthetic petroleum resins and giving additional information on the application of the "Petropons" in decorative and protective coatings, core oils, floor coverings, printing inks, papers, insulation, rubber, and anti-friction materials. American Mineral Spirits Co.

Carbon and Graphite Products

20-p. illustrated catalog section describing "National" carbon and graphite and "Karbate" impervious carbon and graphite, gives information on sizes and physical characteristics of these products which find application in the chemical and process, metallurgical, mechanical and electrical fields. Additional data is given in tabular form on the corrosion resistance, heat conductivity, performance and permeability of the various materials. National Carbon Co.

Reinecke Salt

Bulletin covering the uses, properties and price of Reinecke salt. Jasonols Chemical Corp.

Equipment

Thickeners

24-p. bulletin illustrating and describing various models of the firm's thickeners, mechanically operated sedimentation units by means of which a thick underflow sludge and a clear overflow liquor are produced from a continuous feed made up of a mixture of finely divided solids and a liquid. Special mechanisms, control devices and the engineering service are also covered. The Dorr Co.

Electronic Instruments

12-p. illustrated price list giving details on description, use, operating principle and price of the firm's line of instruments and accessories, utilized for radioactivity measurements—such as scalers, Nucleometers, health instruments, Geiger and proportional counters, shields and safety devices and accessories. Radiation Counter Laboratories, Inc.

Double Pitch Roller Chains

12-p. bulletin featuring charts, diagrams and tables in explaining the construction and operation of double pitch roller chains—both drive and conveyor types—along with the standard attachments. Chain Belt Co. of Milwaukee.

Generator Units

8-p. bulletin concerned with the construction and operation of firm's series of steam turbine generator units in NEMA ratings from 2000 to 7500 kw; units are built in the condensing type for power generation only, while the non-condensing and automatic extraction types provide a steam-power balance where process steam is used. Allis-Chalmers Mfg. Co.

*Plunger Sludge Pumps

16-p. technical bulletin covering firm's line of plunger sludge pumps, with information on liquid processing and the general subject of industrial waste treatment; included here are engineering data and specifications, pump and motor selection charts and lubrication details. Ralph B. Carter Co.

Magnetic Separation

12-p. catalog describing the line of magnetic separators and lifting magnets, indicates which magnets to use in removing iron from wet or dry materials carried on conveyor belts, also from chutes, ducts, etc.; bulletin can be used as guide to the selection of a magnet from the application standpoint. Dings Magnetic Separator Co.

Electronic Relays

4-p. bulletin explaining construction details and operating instructions for three models of electronic relays for laboratories; also presented here is a table of relay characteristics intended as an aid in selecting the proper relay. The Emil Greiner Co.

Rotary Packet Switches

12-p. folder providing engineering data on the structure, operation, and advantages of rotary packet switches, with additional data on combinations available, ratings, dimensions and mounting types. The Arrow-Hart & Hegeman Electric Co.

Heat Exchanger

4-p. bulletin illustrating and describing heat exchanger which uses air as its cooling medium by evaporating a water spray; in keeping a fluid at uniform temperature; exchanger is used in the metal working field as well as the process industries. Niagara Blower Co.

Asbestos Packings

8-p. bulletin describing and giving standard sizes, packaging specifications and weights of line of braided and twisted asbestos packings. Raybestos-Manhattan, Inc.

General

*Industrial Directory

173-p. fourth edition of the Louisiana Industrial Directory lists more than 2,200 of the state's manufacturing firms and 1,140 of the state's products—for businessmen interested in buying or selling Louisiana-made products. Dept. of Commerce and Industry, Baton Rouge, La.

Chemical Services

4-p. folder listing services of company in the line of organic chemicals—such as elemental or functional determinations, physical tests, comprehensive analyses, and special services. Raymond C. Crippen Research & Development Labs.

* Request must be made directly, on business letterhead.

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B & A ANNOUNCES INCREASED PRODUCTION OF ANHYDROUS CALCIUM CHLORIDE

Purified and Reagent Grades

New Production Process Incorporates Latest Developments in Equipment and Automatic Control. Assures Consistent Quality, Uniform Particle Size!

To serve growing needs of chemical, pharmaceutical and food industries, Baker & Adamson has added extensive new production facilities for high purity Anhydrous Calcium Chloride at its B&A Works, Marcus Hook, Pennsylvania. Incorporating the latest developments in automatic control, the new process assures consistent quality and uniform particle size of the product.

As in the past, B&A Anhydrous Calcium Chloride—Reagent and Purified Grades—is available in various sizes ranging from number 20 mesh to ½" lumps. Each size is carefully processed to meet exacting production requirements. Like the reagent grade, the purified material is carefully controlled for alkalinity, making it especially adaptable for industrial drying operations. Both grades are porous to provide maximum absorption.

This increased productive capacity will enable Baker & Adamson to meet expanded laboratory and industrial requirements, as well as to maintain adequate stocks at the company's distributing stations throughout the country.

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Dibutyl CARBITOL $C_4H_9O(C_2H_4O)_2C_4H_9$	0.8853	254.6	0.3	1.4	260
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